

4211 Graphics Netstation

Printed NOV 1989

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GRAPHICS NETSTATION OPERATORS

*Please check for
CHANGE INFORMATION
at the rear of this manual*

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested to comply with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the users at their own expense will be required to take whatever measures may be required to correct the interference.

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MANUAL REVISION STATUS

PRODUCT: 4211 Graphics Netstation

This manual supports the following versions of this product: Firmware Version 5 and up.

REV DATE	DESCRIPTION
OCT 1988	Original issue
MAR 1989	This revision includes the following Version 4 firmware features: <ul style="list-style-type: none">● Hardcopy support for DEC LA210 Letterprinter● Hardcopy support for TEKTRONIX ColorQuick Printer● Plotter support for HPGL-compatible printers● Coax and LAN support (both previously documented)● New technical information on the Self Test program, the KEYMODE command, and host communications
SEP 1989	This revision includes the following Version 5 firmware features: <ul style="list-style-type: none">● Hardcopy support for the Alps ALQ-324e, DEC LN03, Epson LQ-2500, and Hewlett-Packard DeskJet printers● Katakana and Swiss-German Keyboards● Greek, JIS Katakana, JIS Roman, Swiss-German, and DEC Technical character sets● Keyboard Usage mode and KEYUSEMODE command permit entering ASCII characters from non-ASCII keyboards
NOV 1989	This revision adds Appendix G, <i>Command Summary</i> (formerly a separate manual).

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OPERATOR SAFETY SUMMARY

This general safety information is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

In This Manual

CAUTION statements identify conditions or practices that can result in damage to the equipment or other property.

WARNING statements identify conditions or practices that can result in personal injury or loss of life.


As Marked On Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

In This Manual

 This symbol indicates where applicable cautionary or other information is to be found.

As Marked On Equipment

 DANGER high voltage.

 Protective ground (earth) terminal.

 ATTENTION — refer to manual.

DO NOT REMOVE COVERS OR PANELS

To avoid personal injury, do not remove the product covers or panels. Do not operate without the covers and panels properly installed.

POWER SOURCE

This product is intended to operate from a power source that does not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

GROUNDING THE PRODUCT

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the power input or output terminals. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

DANGER ARISING FROM LOSS OF GROUND

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) can render an electric shock.

USE THE PROPER POWER CORD

Use only the power cord and connector specified for your product.

Use only a power cord that is in good condition.

Refer cord and connector changes to qualified service personnel.

USE THE PROPER FUSE

To avoid fire hazard, use only the fuse specified in the parts list for your product, and which is identical in type, voltage rating, and current rating.

Refer fuse replacement to qualified service personnel.

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERES

To avoid explosion, do not operate this product in an atmosphere of explosive gases unless it has been specifically certified for such operation.

INTRODUCING THE 4211 GRAPHICS NETSTATION

The TEKTRONIX 4211 Graphics Netstation is a powerful color graphics system with additional networking capabilities, offering a blend of high-speed local graphics and versatile connectivity.

Where the 4211 Netstation is equipped with the Coax option, it is compatible with both IBM and RS-232 hosts. With the LAN (local area network) option, you can connect into an Ethernet based TCP/IP network. This allows efficient communication between hosts, workstations, terminals, and other resources in your computing environment.

The 4211 delivers crisp, high quality graphics and is ideal for computer-aided design, cartography, electrical engineering, and other technical applications. The 4211 is compatible with many graphics software packages, as well as several popular text-editing packages.

For brilliant hardcopy output of your designs, maps, and presentations, the 4211 supports a wide range of plotters, printers, and copiers from Tek and other vendors.

WHO SHOULD READ THIS MANUAL

This Operator Manual was written for users who will be using the 4211 to run any of a wide range of existing applications. Typical applications include programs for engineering design, technical data analysis, and text editing.

This manual wasn't written for programmers who will be developing or maintaining applications programs for host computer systems. If you plan to write or maintain programs for the 4211, you should order the optional *4210 Series Programmers Manual*. (A further discussion of the programmers manual follows under "Related Documentation," and you can find ordering information later in this section.)

HOW TO USE THIS MANUAL

Take a look at the bulleted list to see what is in each section — knowing how the manual is organized will help you find any specific information you are looking for.

- *Introducing the 4211 Graphics Netstation* — If you want to quickly review the capabilities of the 4211, use *Section 1*.
- *Installation* — If you want to install your 4211 Netstation and connect it to a host computer, or install printers or other peripheral devices, turn to *Section 2*.
- *Getting Acquainted* — If this is the first time you have used a Tektronix netstation, you'll find some introductory information in *Section 3*.
- *Communicating With a Host Computer* — If you are ready to establish the host communications link by setting the appropriate communications parameters, turn to *Section 4*.
- *Using Printers, Plotters, and the Rasterizer* — If you would like procedures for using printers, plotters, or the rasterizer, use *Section 5*. (You'll find installation information in *Section 2*.)
- *Inputting and Displaying Graphics* — If you are using a tablet, mouse, or another device for inputting or displaying graphics, see *Section 6*.
- *Customizing Your 4211* — If you want to change the way your 4211 operates (for example, to increase the number of lines in the dialog area), see *Section 7*.
- If you need information on preparing your 4211 to run host programs, use *Section 8*.

Use the appendices in the manual for reference as needed; be sure to scan the table of contents to find out what is in each one. Don't forget to use the index and glossary to locate any specific information you require.

After you have used this manual for a while, please fill out one of the reader reply cards (in the front of this manual) and drop it in the mail. Your response will help make future manuals more useful.

NOTE

Information, instructions, and responses with shaded gray background (as shown here) refer only to the 4211 with the Coax option.

RELATED DOCUMENTATION

The *4210 Series Command Summary* you received with your 4211 shows command syntax and condensed descriptions of all commands.

The optional *An Introduction to Computer Color Graphics* introduces you to basic computer color graphics in easy-to-understand terms and shows how the specific features support specific graphics tasks. This book also shows a variety of computer graphics applications; you may want to read it to become familiar with how computer graphics are used in business and industry.

The optional *4210 Series Programmers Manual* contains host programming information and detailed descriptions of all commands. It is intended for programmers who will be writing or maintaining application programs for host computer systems. If you will be programming for the 4211, or if you need more information than is contained in your Operators Manual and Command Summary, you will want to order this manual. (See "Ordering Information" later in this section.)

Service manuals are also available; refer to "Optional Accessories" later in this section.

OVERVIEW OF THE 4211 GRAPHICS NETSTATION

The 4211 Graphics Netstation is microprocessor-controlled, specially designed to display and modify high precision graphics and to edit text. Each 4211 consists of three modules:

1. *Display Module* — The Display module receives video output from the Graphics module and displays it on the screen.
2. *Graphics Module* — The Graphics module gets data from a host or the keyboard and processes it for display on the Display module.
3. *Keyboard* — The low-profile VT200-compatible keyboard contains ASCII keys, programmable function keys, a numeric keypad, and a multipurpose cursor pad to scroll text and control the graphics cursor. Snap-down legs under the keyboard adjust the keyboard angle.

The optional coax keyboard provides IBM 3179G/3192G, DEC VT200, and Tektronix 4200 keyboard functionality.

Host Communications

- *RS-232, Coax, and LAN Ports* — The 4211 has up to three host communications ports: one for RS-232-C communications, one for optional IBM 3270 coaxial communications, and the other for the optional LAN communication.
- *Host Port Switching* — You can easily switch to communications through the RS-232-C port, through the coax port, or through the optional LAN port.
- *Multiple Sessions* — During coax communications, you can run up to seven (six without the LAN option) applications simultaneously.

User-Friendly Interface

- *Setup* — Setup is a special operating mode that lets you enter intelligible English-style commands from the keyboard to control the operating characteristics.
- *Zoom/Pan* — Predefined function keys let you zoom in on or pan across a graphics image to display different portions in more detail.
- *Help* — This easily accessible help facility gives you a quick reference to command names and the kind of parameters they require, all displayed on the screen.
- *Status* — Also easily accessible, the status facility displays the current settings on the screen: you can check all settings, selected groups of settings, or just one specific setting.
- *Snoopy Mode* — This programmer's troubleshooting aid displays incoming control characters on the screen.
- *Local Mode* — Sends commands entered on the keyboard to the 4211's command processor, which are then executed as if they had come from the host.

High Quality Color

- *Multicolor Palette* — Your 4211 has a palette of 4096 (16M optional) colors to choose from for graphics and text display. You can select 8 of these colors for displaying text; the number of colors (16 standard, 256 optional) you can choose to display in the graphics area is dependent on your system configuration.
- *Color Models* — You can specify colors using one of four color models: RGB (red, green, blue), machine RGB, CMY (cyan, magenta, yellow), and HLS (hue, light, saturation).
- *Video Output* — Red, green, and blue video-out connectors can send color signals to an external monitor or color hardcopy device, such as a 35mm slide camera.

High Performance

- *Screen Addressability* — The 4211 delivers sharp alphanumerics and crisp, clean graphics. It offers a 1024x768 pixel display on a 15" or an optional 19" display.
- *Fast Refresh* — A 60Hz noninterlaced raster-scan display eliminates flicker, resulting in bright colors and a stable image.
- *Coordinate Range* — You can specify xy-coordinates in a range of 4 billion by 4 billion points.
- *Memory* — .75M bytes of memory is available to support intelligent graphics functions. You can increase your memory capacity by ordering additional memory (see "Options" later in this section for ordering information).
- *Pixel Operations* — Programs can control individual pixels on the screen to create customized images.
- *Host Communications* — RS-232-C data transfer rates of up to 38,400 baud (bits per second) display graphics quickly and reduce host communication time.

The optional local area network (LAN) interface provides an even higher-speed host communication and enables you to access other machines on the network.

Powerful Graphics Processing

- *Graphics Surfaces* — You can use four or optionally eight separate surfaces for displaying graphics. Each surface can have its own colors and its own graphics, and each can be displayed independently of the others; all surfaces can be overlaid on top of each other.
- *Graphic Input* — Graphic input lets you easily enter graphics data — like locations on a map — required by an applications program. The application may also use features such as gridding, inking, rubberbanding, and multiple graphics input windows to aid you in your task.
- *Segments* — You can combine several individual graphics elements to create a segment, which you can then copy, move, scale, or rotate as a unit. Additionally, you can save segments to a host to be used repeatedly in your application.
- *Graphtext* — Commands allow scaling and rotation of text in the graphics area. Graphtext font commands let you define your own font styles for the graphics area.
- *Multiple Views* — You can display up to 64 separate views, each with its own, or shared, graphics.

Graphics Display Support

- **Tek Mode** — This form of host command mode lets you run software that uses Tek-style commands (that is 4200, 4100 and most 4010 escape sequences). This means that programs written for the 4211 are compatible with programs written for the TEKTRONIX 4010, 4110, and 4111 with minimal or no modification.
- **GDDM** — 4211's with the Coax option can also run applications which interpret and display data from IBM's Graphical Data Display Manager (GDDM).

Multiple Graphic Input Devices

- **Keyboard** — You can use the arrow keys to move the graphic input cursor while you use keyboard keys to send graphics coordinates to the host.
- **Graphics Tablets** — You can use TEKTRONIX 4957 and 4958 Graphics Tablets to interact with existing graphics applications.
- **Mouse** — You can order an optional mouse to use as a graphic input device — the mouse simply plugs into the side of the keyboard.
- **Thumbwheels** — The optional thumbwheel assembly fits into the side of the keyboard. It can be used as a graphic input device.

Dual Display Areas

- **Two Display Areas** — A dialog area and a graphics area let you separate non-graphics text from graphics.
- **Independent Operation** — The separate dialog area lets you edit text without interfering with the graphics image.

Versatile Text

- **Characters per Line** — The number of characters per line is dependent on the character size you are using. With smaller characters, it is possible to fit up to 132 columns of text on the screen.
- **Scrolling** — Vertical scrolling lets you scroll through the dialog buffer to see lines of text that are out of view. You can also select the size of the dialog buffer.
- **3179 Emulation** — During coax communications, the dialog area provides the same alphanumeric capability as the IBM 3179G/3192G Display Station as well as GDDM compatibility. An operator information area beneath the dialog area displays status information from the host.

Screen Editing Support

- **ANSI Mode** — This host command mode supports many common text-editing applications that use the ANSI 3.64 standard.
- **VT200 Mode** — This terminal emulation mode supports text-editing functions for programs designed for DEC VT200 display systems.
- **VT100 Mode** — This terminal emulation mode supports text-editing functions for programs designed for DEC VT100 display systems.

Quality Hardcopy Output

- **Color Printers** — The 4211 can drive a wide range of color printers to provide color hardcopies of your graphics and text.
 - You can connect to a TEKTRONIX 4692 or 4696 Color Ink-Jet Printer, to a TEKTRONIX ColorQuick Printer, or to a 4693RGB or 4693D Color Graphics Copier.
 - You can connect to an Epson LQ-2500 wide-carriage color dot matrix printer or to other printers compatible with it, such as the Alps ALQ 324e.
- **Monochrome Printers** — The 4211 can drive a wide range of monochrome printers to provide black-and-white hardcopies of your graphics and text.
 - You can make monochrome graphics and text copies on DEC LA210 Letterprinter and LN03 Laser printers.
 - You can make monochrome graphics and text copies on Epson FX-80 graphics-compatible printers, including the Tektronix 4644.
 - You can make monochrome graphics and text copies on Hewlett-Packard DeskJet, LaserJet+, LaserJet Series II, and ThinkJet printers.
 - For monochrome text-only copying, you can connect to printers that use a Centronics-style parallel interface with the Epson FX-80 protocol.

STANDARD ACCESSORIES

The following items are delivered with the 4211 Netstation (Display module, Graphics module, and keyboard) as standard equipment:

- *4211 Graphics Netstation Operators Manual* (this manual)
- *4210 Series Command Summary*
- Function key overlays
- RS-232-C host port cable (connects the 4211 to the host or a modem)
- Power cords¹
- Cable straps
- Tilt/swivel for display
- RGB cable

OPTIONAL ACCESSORIES

The following optional items can be ordered separately (refer to "Ordering Information" later in this section for information).

- *4210 Series Programmers Manual*
- *An Introduction to Computer Color Graphics*
- *4211 Field Service Manual*
- *Monitor Field Service Manuals*
- Floor stand
- RGB extension cable
- Keyboard extension cable

OPTIONS

The 4211 can be ordered with the following optional equipment and field-installable kits. Optional equipment for purchase with your 4211 is labeled *Option*. Field-installable kits to be installed in a 4211 that has already been purchased are labeled *4200Fxx*.

- Memory
 - Option 22 (4211F22) — Add 1 MB RAM (total approx. 1.75MB)
 - Option 23 (4211F23) — Add 2 MB RAM (total approx. 2.75MB)
- Graphics
 - Option 2A — Add 4 Bit Planes (total 8, also increases color palette to 16M colors)
- Displays
 - Option 32 — 19" Display (same addressability as standard display)
- Power Cords¹
 - Option A1 — Universal European (220 V)
 - Option A2 — United Kingdom (240 V)
 - Option A3 — Australian (240 V)
 - Option A5 — Swiss (240 V)
- Coax Interface
 - Option CX (4211FCX) — North American
- LAN
 - Option 3H (4211F3H) — Ethernet LAN Connection

1. The 4211 is shipped with two 115 V North American power cords and a North American keyboard, unless you order otherwise.

- International VT200 Keyboards²
 - Option VA — United Kingdom
 - Option VB — French
 - Option VC — Swedish
 - Option VF — Danish/Norwegian
 - Option VG — German
 - Option VI — Italian
 - Option VJ — Swiss-German
 - Option VS — Spanish
 - Option 4K — Katakana (Japanese)
- Other Upgrades
 - 4200F4M — Mouse
 - 4200F4T — Thumbwheels
 - 4211F01 — Upgrade to most recent firmware
 - 4200FKB — VT200 North American Keyboard
 - Option VH (4200FVH) — Sealed VT200 North American Keyboard
 - Option 31 — Delete Keyboard
 - Option 49 — Rental ID Tag

ORDERING INFORMATION

Table 1-1 contains part numbers for ordering replacement or optional accessories.

Table 1-1
ORDERING INFORMATION

Item	Part Number
<i>4211 Graphics Netstation Operators Manual</i>	070-7138-00
<i>4210 Series Command Summary</i>	070-7139-01
<i>4210 Series Programmers Manual</i>	070-7137-00
<i>An Introduction to Computer Color Graphics</i>	070-5239-01
<i>4211 Field Service Manual</i>	070-7140-00
<i>4211 Monitor Service Manual</i>	070-7141-00
Floor Stand	016-1006-00
Function key overlays (blank)	334-6983-00
RS-232-C host port cable	012-0911-00
RS-232-C Host Port Loopback Connector (can be used for Self Test)	067-1043-00
COPIER Port Loopback Connector (can be used for Self Test)	013-0214-00

2. The 4211 is shipped with a North American keyboard unless you order one of the international keyboards. International coax keyboard available. Contact your local field office. For information on keyboards, refer to *Appendix A*.

INSTALLATION

SETTING UP THE 4211 GRAPHICS NETSTATION

This section covers the unpacking and installation of your 4211. You will also find information on installing peripherals. Use the following list to locate specific information.

- If you have just received your 4211 Netstation and need unpacking and installation instructions, the first topic "Selecting a Site" will be a good place to start.
- If you are ready to connect the 4211, refer to "Connecting the Modules."
- If your 4211 is connected and you would like information on connecting a printer or other peripheral, look at "Connecting Peripheral Devices."
- If your 4211 is set up and ready for setting communications parameters, turn to Section 4, *Communicating with a Host Computer*.

The only tools you need to set up the 4211 are a box opener or knife and a small, flat-blade screwdriver.

SELECTING A SITE

The installation site you select should meet the following requirements.

CAUTION

Do not block air flow or cover the 4211's air vents in any way. This could cause overheating and result in circuit damage.

- The site should provide enough room for adequate ventilation and cable routing. The Display module's air vents should be at least 6 in. (152 mm) from the nearest wall or surface. Allow at least 6 in. (152 mm) at the rear of the Display for cable routing. Allow 3 in. (76 mm) at the rear for the Graphics module. Use Figure 2-1 (next page) as a guide.
- The site should provide a stable environment. While the 4211 is operating, the ambient temperature should stay within 50 to 104°F (+10 to +40°C).

Relative humidity should stay between 20% and 80%.
Do not operate at an altitude greater than 15,000 ft.

If any of these operating limits are exceeded, the 4211 may not operate properly.

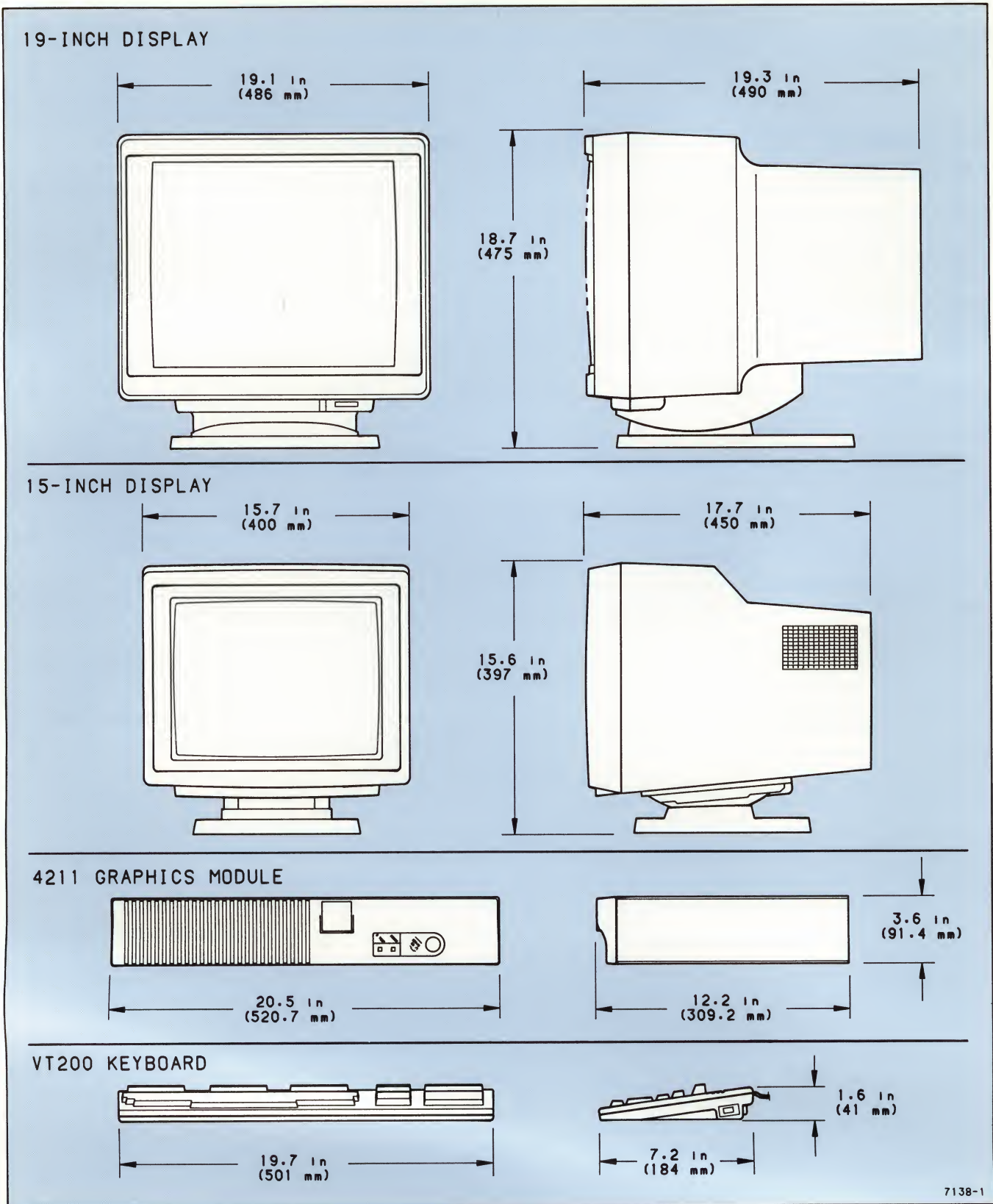


Figure 2-1. Dimensions and Clearances.

UNPACKING

Your 4211 is contained in two shipping cartons. One contains the Display module, the other contains the Graphics module, keyboard and accessories.

After you open the carton and remove this manual, continue with the following procedures. Refer to Figure 2-2 (next page) as a guide to help you unpack.

- To continue unpacking the Graphics module and keyboard:
 1. Remove the keyboard, cable, power cords and any remaining packing foam.
 2. Remove the Graphics module and place it in a selected location.
- To unpack the Display module:
 1. Cut the straps and the tape on the top and sides of the carton.
 2. If you have the 15" Display module, open the top of the carton at the center and side seams.
 3. If you have the optional 19" Display module, open the side handles.
 4. Remove the foam from each corner and move the Display module to a selected location.
- Check the equipment you received against the accessories list in Section 1 of this manual. If any items are missing, notify your Tektronix sales representative immediately.
- Inspect the equipment for any signs of damage. Report any damage to the carrier and contact your Tektronix sales representative immediately.
- Check that you have received the correct power cords (voltage and plug type) for your ac power source. The plugs should fit securely into the power outlet.
- Save the packing material in case you need to move the 4211 in the future. Use Figure 2-2 (next page) as a guide to help you repack the various modules of the 4211 in the correct cartons.

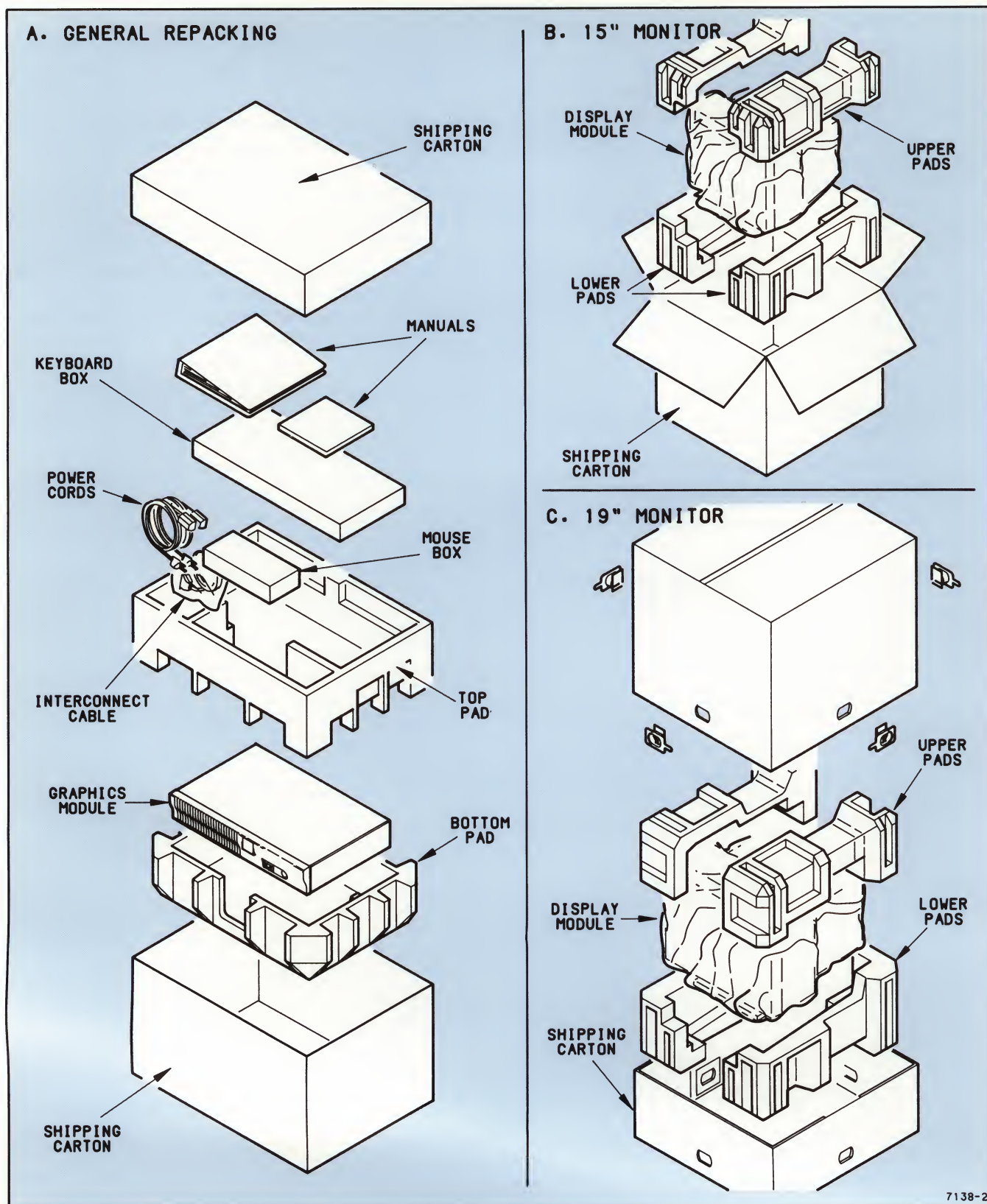


Figure 2-2. Unpacking and Repacking Diagram.

CONNECTING THE MODULES

The 4211 Netstation has three main modules that need to be connected: a Display module, a Graphics module, and a keyboard. In addition you may also need to set up the optional floor stand and install the optional thumbwheels or mouse.

NOTE

All information, instructions, and responses within a shaded gray background (as shown here) refer only to a 4211 with the Coax option.

Your 4211 can be set up in either of two configurations. You can place the Display module directly on the Graphics module as in Figure 2-3, or you can use the optional floor stand for the Graphics module and place the Display module on a desk as in Figure 2-4. See the instruction sheet shipped with the floor stand for more information.

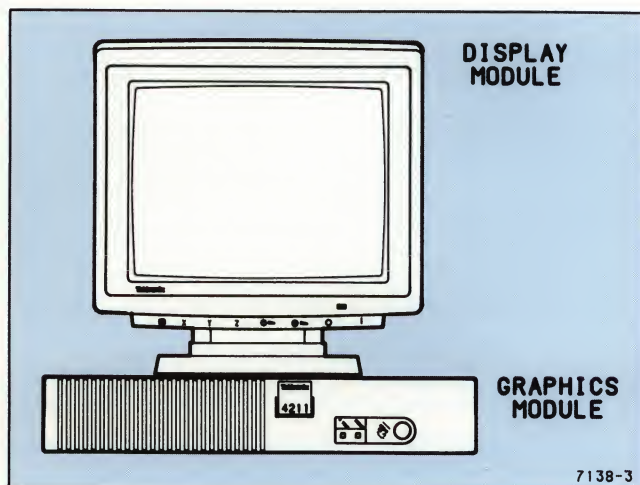


Figure 2-3. Display Module on Graphics Module.

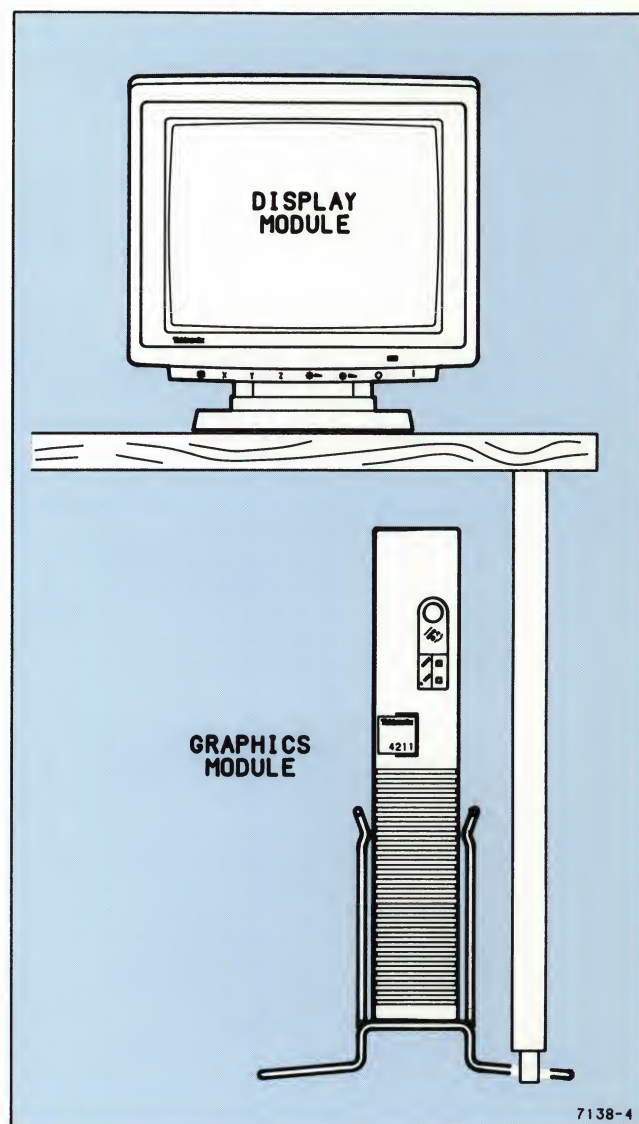


Figure 2-4. Graphics Module on Floor Stand.

Installation

1. Connect the keyboard cable to the **KEYBOARD** connector on the back of the Graphics module as in Figure 2-5. (If you are using the floor stand, remember to use the keyboard cable extension.)

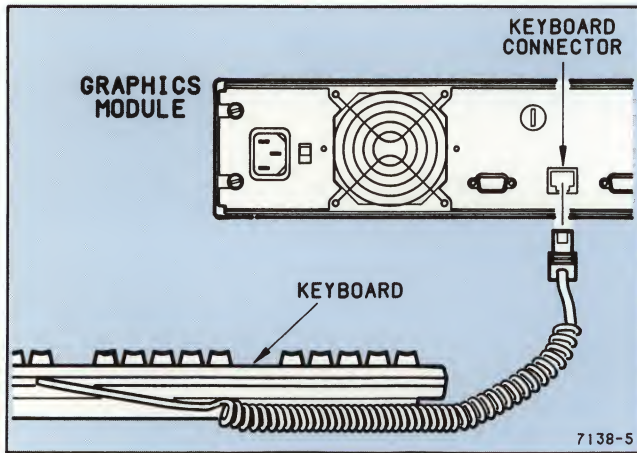


Figure 2-5. Keyboard Connection.

2. If you have the optional thumbwheel assembly (as shown in Figure 2-6), attach it to the right side of the keyboard.

To install the thumbwheels to the keyboard, swing out the two brackets from the left side of the thumbwheels, insert them into the keyboard slots, and secure the stiffeners with screws through the two holes in the bottom of the keyboard and the thumbwheel assembly (see Figure 2-7).

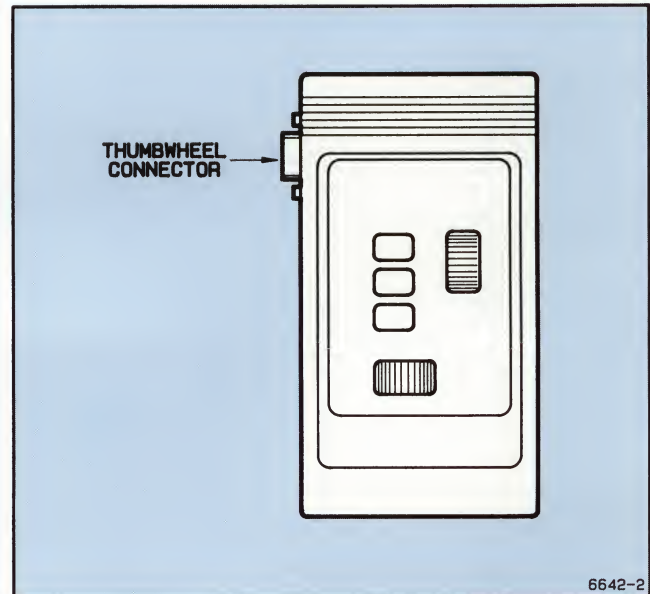


Figure 2-6. Thumbwheel Assembly.

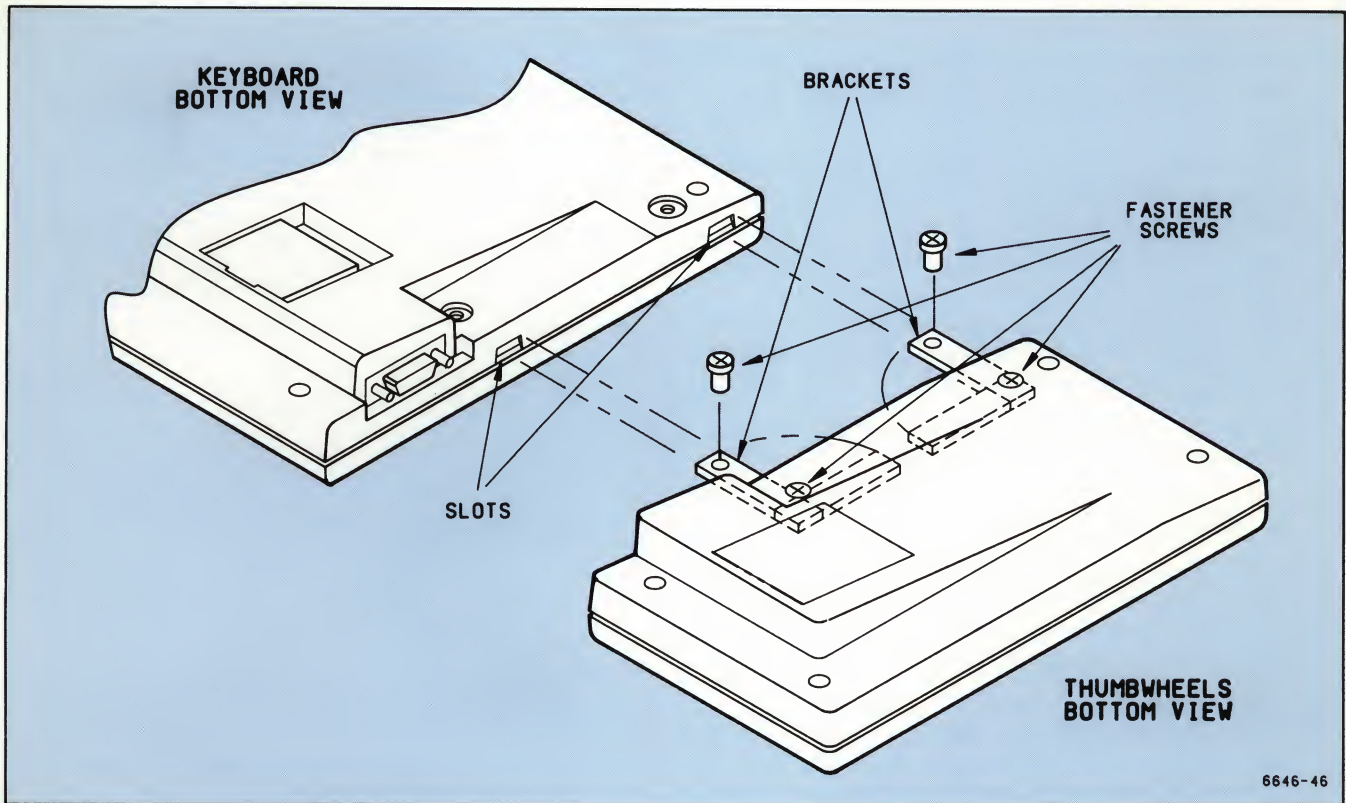


Figure 2-7. Keyboard and Thumbwheel Attachment.

Installation

3. If you have the optional mouse (as shown in Figure 2-8), install the mouse's rubber ball by twisting open the round cover on the bottom of the mouse, placing the ball in the opening, and twisting the cover back on until it snaps in place.

Then, install the mouse by plugging the mouse cable connector into the connector on the right side of the keyboard (see Figure 2-9).
4. Check the voltage selector switch on the back of the Graphics module to ensure it is set to the proper operating voltage, as required by your ac power source. (The Display module automatically adjusts to the proper operating voltage.)

For the voltage ranges, refer to the Electrical Specifications tables for each module in Appendix C.

If the equipment is not set to the proper voltage, move the switch to the correct setting (see Figure 2-10).

5. If you will be using a local area network, attach the LAN cable to the LAN port (see Figure 2-11). Refer to "Local Area Network (LAN) Operator Information" in Section 4 for information on setting up and using the LAN.

6. If you are connecting to an IBM host, connect the coaxial cable's BNC connector to the COAX CONNECTOR port. Push and twist the cable's BNC connector clockwise into its locked position. Refer to Figure 2-12.

NOTE

*The queue size setting required for coax communications may be different from the queue size setting required for RS-232-C communications. Be sure to check with your systems programmer for a queue size that is compatible with both types of host communications. then use the **QUEUESIZE** command discussed in the **4210 Series Command Summary** to select the appropriate queue size setting.*

7. If you will be using RS-232-C communications, connect the RS-232-C cable to the Graphics module's COMPUTER port as in Figure 2-13. Secure the cable connector to the Graphics module with the two connector screws. Connect the other end of the cable either to a modem or directly to your host computer.

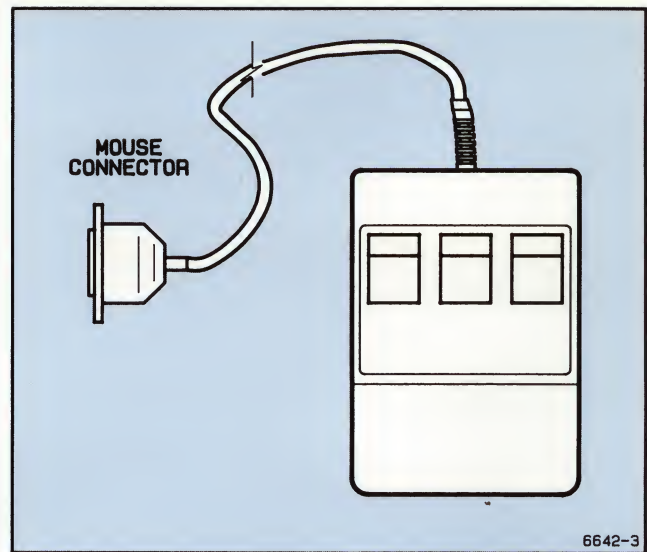


Figure 2-8. Mouse.

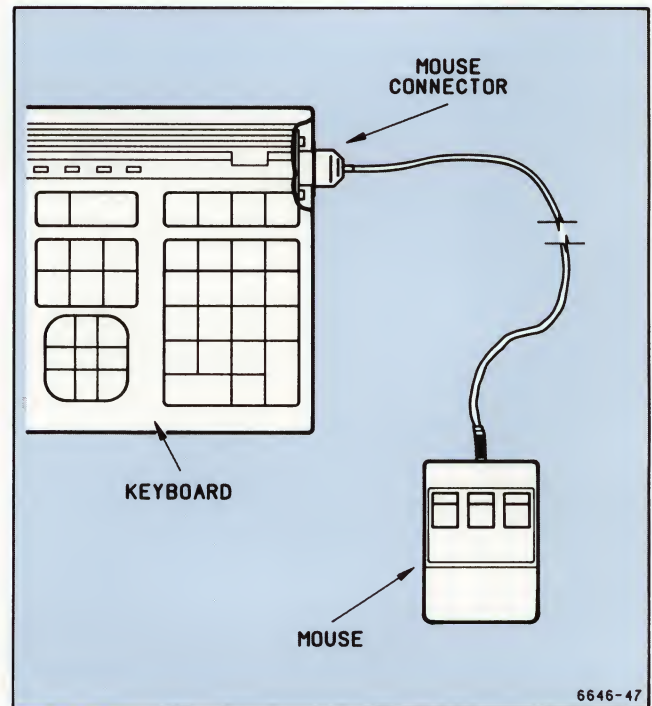


Figure 2-9. Keyboard and Mouse Attachment.

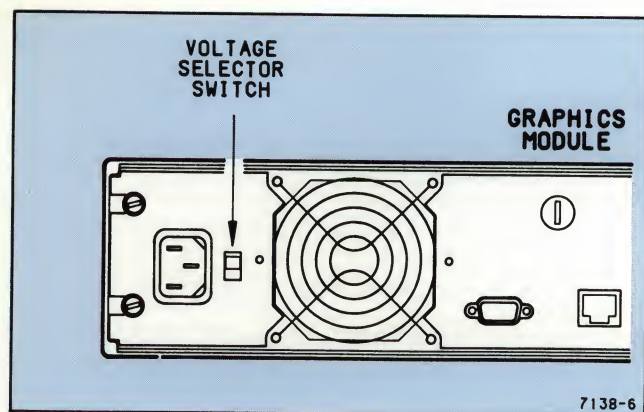


Figure 2-10. Voltage Selector Switch.

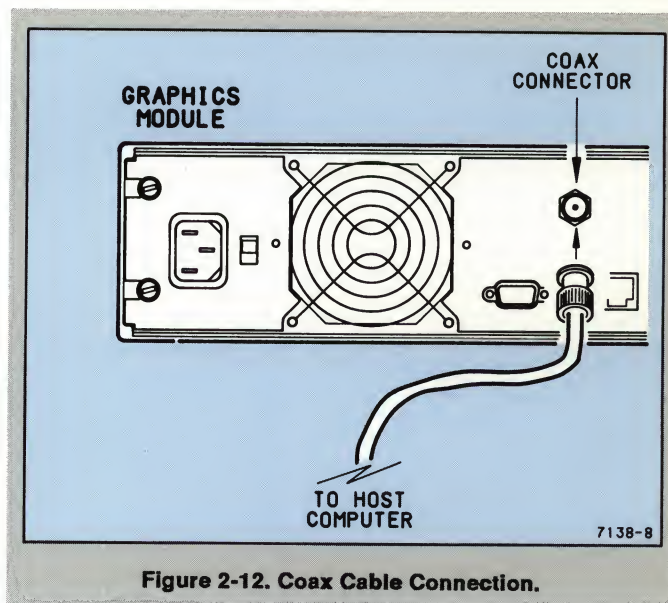


Figure 2-12. Coax Cable Connection.

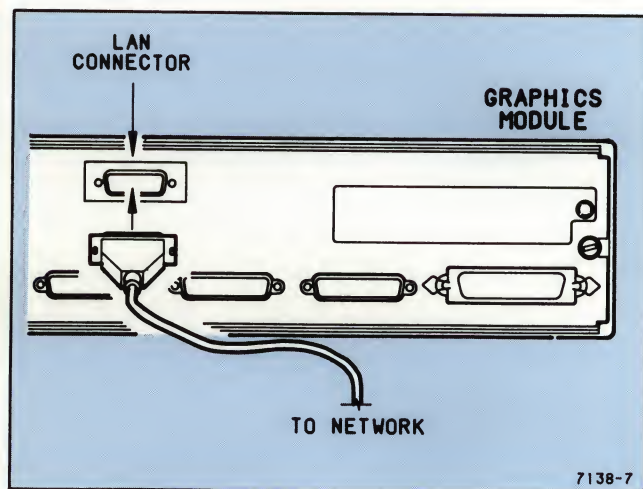


Figure 2-11. LAN Cable Connection.

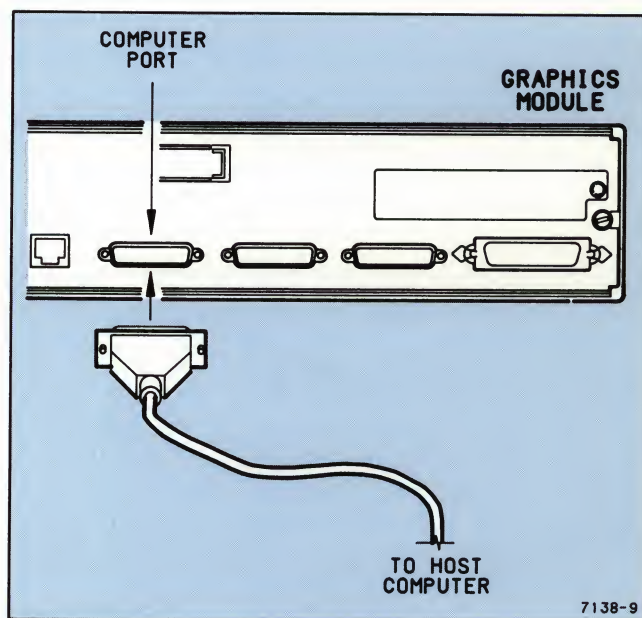


Figure 2-13. RS-232 Cable Connection.

Installation

8. Connect the Graphics module to the Display module using the coax cable as shown in Figure 2-14. (If you are using a floor stand, remember to use the coax cable extension.) Connect one end of the cable to the Video Connector on the Graphics module and the other end to the Video In Connectors on the Display module.

CAUTION

There are two sets of video connectors on the Display module. Be sure to connect the video cable to the Video In connectors. To avoid improper brightness or damage to the Display module, do not connect this cable to the Video Out connectors.

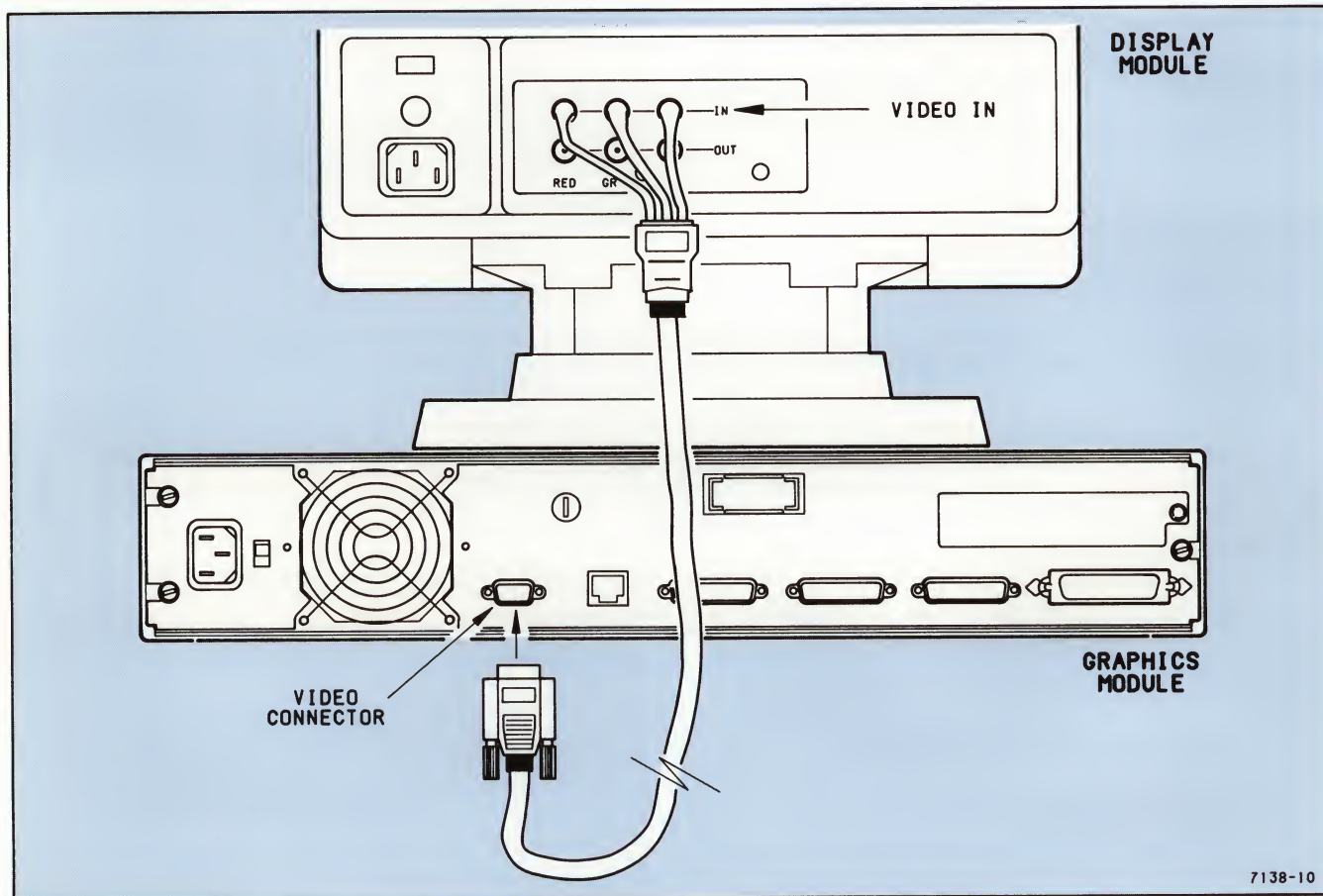


Figure 2-14. Video Cable Connection.

POWER-UP

CAUTION

To avoid damage to the 4211, the voltage selector switch (on the back of the Graphics module) must be set to the correct voltage. This should have been done in step 4 under "Connecting The Modules." If it was not set when the modules were connected, refer to that step and set it to the correct voltage before proceeding with these instructions.

1. Attach the female ends of each of the two ac power cords to the rear of the Graphics and Display modules and insert the male ends of each of the cords into the ac power outlets.
2. Press the POWER switch on the front panel of the Display module, and the POWER switch on the front of the Graphics module (refer to Figure 2-15). The 4211 will run Power-Up Self-Test, which takes about 30 seconds. If a cursor doesn't appear after about 30 seconds, refer to "Running Power-Up Self Test" just ahead.
3. Adjust the BRIGHTNESS and CONTRAST controls on the front of your Display monitor to your viewing preference. (Turning the controls clockwise increases brightness and contrast.)

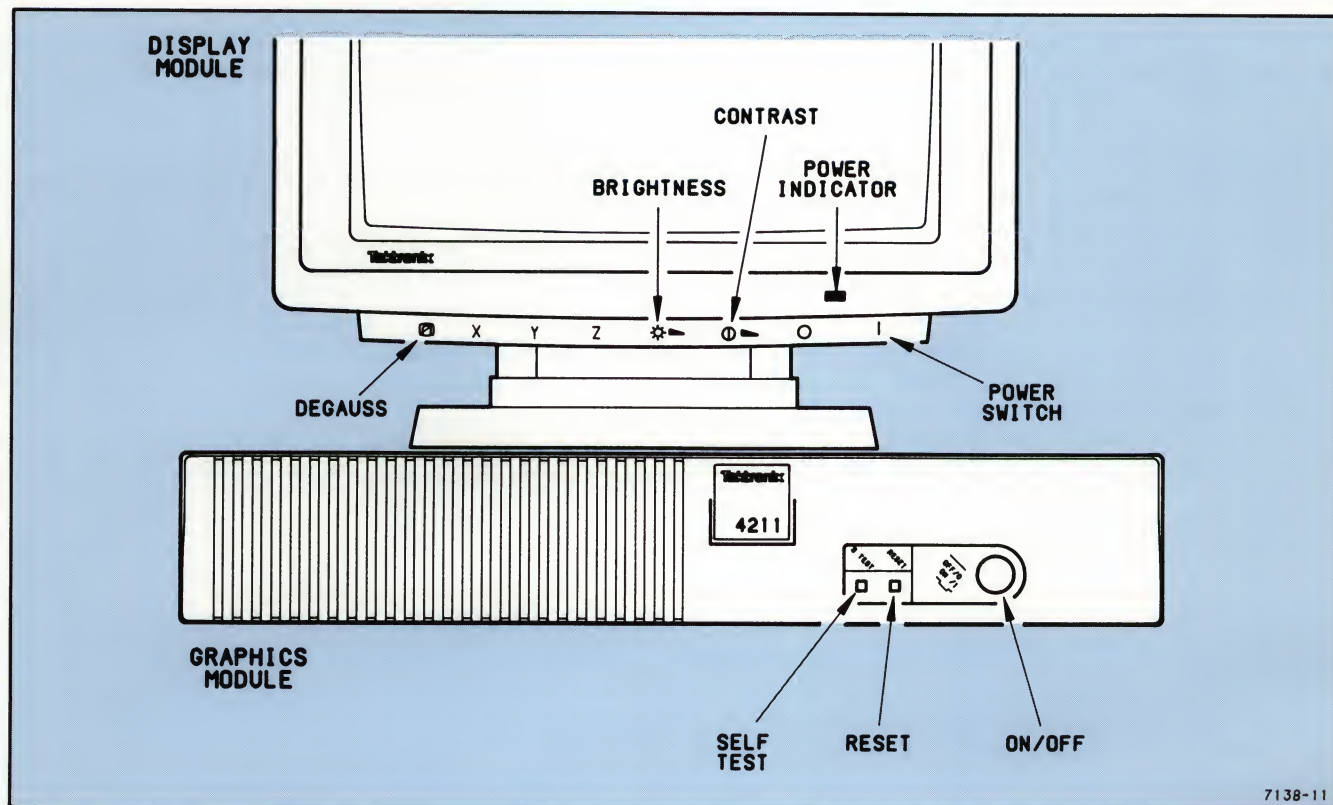


Figure 2-15. Front View.

Installation

- Using the Display module tilt-swivel stand shown in Figure 2-16, tilt the Display module forward or backward to a comfortable viewing angle. You can rotate the Display module side-to-side for further adjustment.
- You can also adjust the angle of the keyboard by extending the legs located on the bottom of the keyboard (see Figure 2-17).

NOTE

If you are connecting your 4211 to a host computer system and are not installing any peripheral devices, refer to Section 4, Communicating with a Host Computer. If you are installing peripherals, they should be connected to the 4211 and checked out before you attempt to establish host communications.

Running Power-Up Self Test

Each time you turn on the 4211, Power-Up Self Test runs automatically to verify that the 4211 is operating correctly. If a cursor doesn't appear, or if any faults are indicated, you may need to run Power-Up Self Test again by pressing the RESET button on the Graphics module.

- Locate the RESET button on the front of the Graphics module.
- Press the RESET button.

After about 30 seconds, a cursor appears. The cursor indicates that the 4211 is ready for use.

If the test does detect an error, it rings the keyboard bell, lights up keyboard indicator lights, writes a message on the screen, or all three. If this occurs:

- Check all the cables and connectors.
- Note the message and press the spacebar. If the problem is not serious, the Power-Up sequence will continue. If however, the problem prevents the 4211 from working, try pressing the RESET button to run Power-Up Self Test again.

If the 4211 still indicates a problem, contact your local Tektronix field service center.

For more information on the Self Test Diagnostic Program, see Appendix B.

- After you have verified that the 4211 is functioning properly, you can continue with these installation procedures.

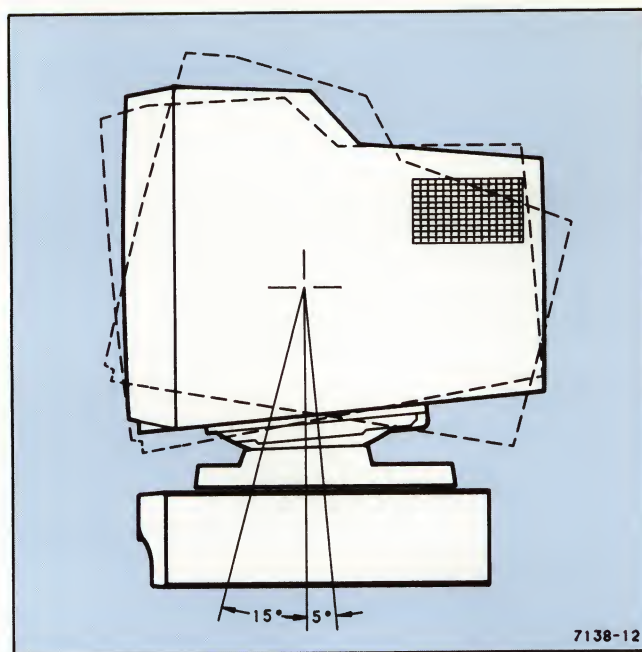


Figure 2-16. Display Module Tilt Swivel Adjustment.

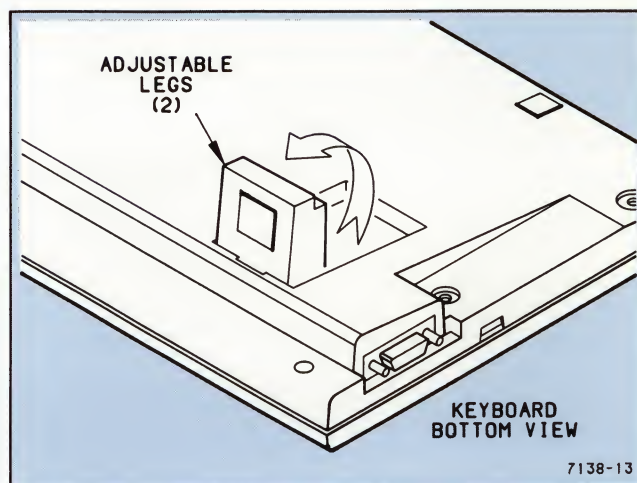


Figure 2-17. Keyboard Angle Adjustment.

CONNECTING PERIPHERAL DEVICES

The following instructions tell how to connect peripheral devices to the 4211 and set their communications parameters. You should also follow any other installation instructions provided with the peripheral device.

If you have not entered commands in Setup, refer to Section 3 for information on how to enter Setup commands.

The rest of this section contains installation procedures for:

- TEKTRONIX 4692 Color Graphics Copier
- TEKTRONIX 4693D Color Image Printer
- TEKTRONIX 4693RGB Color Graphics Copier
- TEKTRONIX 4696 Color Ink-Jet Printer
- TEKTRONIX ColorQuick Printer
- Alps ALQ324e Printer
- DEC LA210 Letterprinter
- DEC LN03 Laser Printer
- Epson LQ-2500 Printer
- Hewlett-Packard DeskJet Printer
- Hewlett-Packard LaserJet+ and LaserJet Series II Printers
- Hewlett-Packard ThinkJet Printer
- Monochrome printers with Centronics-style interface
- TEKTRONIX 4957 and 4958 Graphics Tablets
- TEKTRONIX 4662 and 4663 Plotters
- Hewlett-Packard 7475A and 7550A Plotters and other plotters that are compatible with the Hewlett-Packard Graphics Language (HPGL) command set
- TEKTRONIX 4510A Rasterizer

You need only refer to those procedures that apply to the device you want to install.

NOTE

Some applications programs running on a host computer may require that some peripherals be connected to a specific port. Check with your system programmer.

Figure 2-18 shows the locations of the Graphics module ports you will use to connect peripherals.

TEKTRONIX 4692, 4693D, AND 4696 COLOR GRAPHICS COPIERS

Use this procedure to install your 4692, 4693D, or 4696 copier:

1. Plug the copier cable into the COPIER port. Secure the cable connector with the two clips attached to the port.
2. Enter Setup (press the Setup key) and then enter the following command:

HCINTERFACE 2

The parameter value (2) tells the 4211 you are using a Tektronix 4692, 4693D or 4696.

3. Save the setting by entering:

NVSAVE

4. If you have a 4696, you may also need to set *Switch 4* on the rear panel of the printer, and press the *MEDIA* button on the front.
 - *Switch 4* tells the copier whether to ignore Carriage Returns from the 4211. If the copier double-spaces lines of text or prints a new line of text on top of the previous line, change the switch setting.
 - The *MEDIA* button selects the type of media — paper or film (transparency) — to be copied on. When set to *PAPER*, the printer prints bi-directionally. When set to *FILM*, the printer prints mono-directionally, allowing more time for the ink to dry on the film and providing better dot alignment.

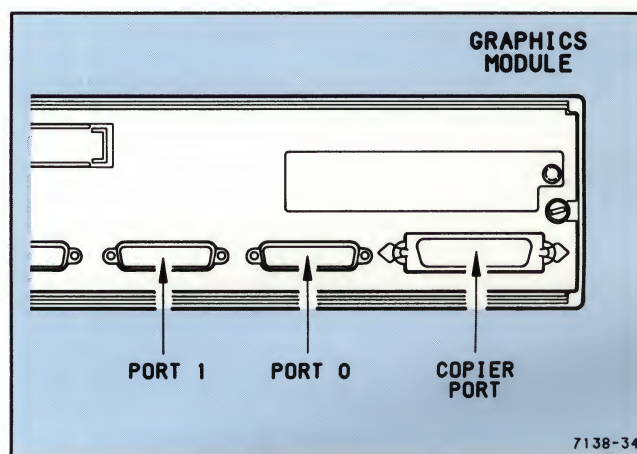


Figure 2-18. Ports for Peripherals.

Notes on the TEKTRONIX 4693RGB Printer

If you are installing a 4693RGB printer, you will adjust the 4211 using instructions in the printer user manual. Some things to keep in mind during the adjustment include:

1. Use 1024 pixels per line wherever number of pixels is called for.
2. Turn off the screen's dimmer whenever the procedure indicates.
3. For Step 10 in the "Creating L Shapes For Fine Calibration" procedure, enter the following commands:

```
CHARSIZE 1,48,128
DALINES 48
DACHARS 128
LOCAL
```

The 4211 should be in Local mode. Exit Setup (press the Setup key) and press the SEras key. Now continue with the final step of the procedure by typing a line of capital L characters on the topmost line of the display. When you have finished with the procedure, reset the 4211 to continue operation.

TEKTRONIX COLORQUICK PRINTER

Use this procedure to install your ColorQuick printer:

1. Plug the printer cable into the COPIER port. Secure the cable connector with the two clips attached to the port.
2. Enter Setup (press the Setup key) and then enter one of the following commands:

```
HCINTERFACE 11
```

or

```
HCINTERFACE 12
```

A parameter value of 11 tells the 4211 you are using a Tektronix ColorQuick printer with A size paper. A parameter value of 12 indicates a ColorQuick printer with B size paper.

3. Save the setting by entering:

```
NVSAVE
```

4. You may also need to set *Switch 4* on the rear panel of the printer, and press the *MEDIA* button on the front.
 - *Switch 4* tells the printer whether to ignore Carriage Returns from the 4211. If the printer double-spaces lines of text or prints a new line of text on top of the previous line, change the switch setting.
 - The *MEDIA* button selects the type of media — paper or film (transparency) — to be copied on. When set to *PAPER*, the printer prints bi-directionally. When set to *FILM*, the printer prints mono-directionally, allowing more time for the ink to dry on the film and providing better dot alignment.

MONOCHROME PRINTERS

If you are installing a monochrome text printer that has a Centronics-style printer interface and supports Epson FX-80 graphics protocol, or a monochrome text printer with a Centronics-style interface, follow this procedure:

1. Plug the printer cable into the COPIER port. Secure the cable connector with the two clips attached to the port.
2. Enter Setup (press the Setup key) and tell which printer is connected.

- For a graphics printer like the TEKTRONIX 4644, enter:

HCINTERFACE 3

The parameter value (3) tells the 4211 that you are using a graphics printer and that the printer uses and understands the American character set.

- For a text-only printer, enter:

HCINTERFACE 0

The parameter value (0) tells the 4211 that you are using a monochrome text printer and that the printer uses and understands the American character set.

3. Make sure the 4211 sends the proper line endings for whatever printer you are using. Find out what the printer expects by either checking the printer's manual or, if the printer has a line-ending switch, by checking the printer's switch setting.

Match what the 4211 sends to what the printer expects. You can either change the printer's switch (if it has one) or change what the 4211 sends.

- To instruct the 4211 to send a Carriage Return/Line Feed combination at the end of each line (this is the default and is correct in most cases), enter:

HCMONOCHROME 1

If you choose 1 and it's the wrong setting for your printer, the copies you make will have an extra blank line following each line of characters (that is, single-spaced text will be double-spaced, and graphics will have an extra blank line after each printer line).

- To instruct the 4211 to send just a Carriage Return at the end of each line, enter:

HCMONOCHROME 0

If you choose 0 and it's the wrong setting for your printer, all your lines of text or graphics will print on the same line — resulting in one unreadable black line.

4. Save the settings by entering:

NVSAVE

DEC LA210 LETTERPRINTER

You can connect the LA210 monochrome graphics printer to the 4211 using the printer's RS-232-C port and either PORT 0 or PORT 1 on the 4211. You can also connect the printer to the COPIER port on the 4211 by using an optional parallel interface adapter (LA10X-EP) available from Digital Equipment Corporation.

LA210 at Port 0 or Port 1

Follow this procedure to connect an LA210 printer to PORT 0 or PORT 1:

1. Set the Baud Rate Select Switches (B1 - B5) on the printer to 9600 (refer to the *LA210 Letterprinter User Guide*).
2. Verify that the rest of the Configuration Switches on the printer are set to their factory settings (refer to the *LA210 Letterprinter User Guide*).
3. Connect the printer's RS-232-C communications cable to PORT 0 or PORT 1. Secure the RS-232-C cable connector to the port by tightening the two small connector screws.
4. Enter Setup (press the Setup key), and tell the 4211 that the printer is connected to it through either PORT 0 or PORT 1:

- For PORT 0, enter:

```
HCINTERFACE 8
```

- For PORT 1, enter:

```
HCINTERFACE 9
```

- Enter the following communications commands. (For this discussion, it is assumed that you are connecting the printer to PORT 1; if you are connecting to PORT 0, substitute P0 wherever you see P1.)

```
PASSIGN P1:,PPORT
PBAUD P1:,9600
PBITS P1:,1,8
PPARITY P1:,NONE
PFLAG P1:,CHAR
HCMONOCHROME 1
```

5. Save the setting in nonvolatile memory so you don't have to reset them again. Enter:

```
NVSAVE
```

Now when you request a screen copy (by pressing the SCopy key), it will be sent to your LA210.

LA210 at COPIER Port

Use the following procedure to connect an LA210 printer to the COPIER port of the 4211. This method of connection allows faster printing because it uses parallel communication lines between the 4211 and the printer; however, it requires the use of an optional parallel interface adapter (LA10X-EP) which is available from Digital Equipment Corporation.

To use the COPIER port, follow this procedure:

1. Turn off the printer power switch.
2. Plug the parallel interface adapter option (LA10X-EP) into the printer EIA connector.
3. Set the parallel interface switches to their down position (refer to the *LA210 Letterprinter User Guide*).
4. Verify that the Configuration Switches on the printer are set correctly (refer to the *LA210 Letterprinter User Guide*).
5. Plug the printer cable into the parallel port on the LA10X-EP.
6. Plug the other end of the printer cable into the COPIER port on the 4211 Graphics module. Secure the cable connector with the two clips attached to the port.
7. Enter Setup (press the Setup key), and then tell the 4211 which printer is connected to it by entering:

```
HCINTERFACE 10
```

8. Save the setting in nonvolatile memory by entering:

```
NVSAVE
```


DEC LN03 LASER PRINTER

You can connect the LN03 monochrome graphics printer to the 4211 using the printer's RS-232-C port and either PORT 0 or PORT 1 on the 4211. Follow this procedure:

1. Set the Baud Rate Select Switches (SP1-2 to SP1-4) on the printer to 9600 (refer to the *LN03 Laser Printer User Guide*).
2. Verify that the rest of the Configuration Switches on the printer are set to their factory settings (refer to the *LN03 Laser Printer User Guide*).
3. Connect the printer's RS-232-C communications cable to PORT 0 or PORT 1. Secure the RS-232-C cable connector to the port by tightening the two small connector screws.
4. Enter Setup (press the Setup key), and tell the 4211 that the printer is connected to it through either PORT 0 or PORT 1:

- For PORT 0, enter:

```
HCINTERFACE 18
```

- For PORT 1, enter:

```
HCINTERFACE 19
```

- Enter the following communications commands. (For this discussion, it is assumed that you are connecting the printer to PORT 1; if you are connecting to PORT 0, substitute P0 wherever you see P1.)

```
PASSIGN P1:,PPORT
PBAUD P1:,9600
PBITS P1:,1,8
PPARITY P1:,NONE
PFLAG P1:,CHAR
HCMONochrome 1
```

5. Save the setting in nonvolatile memory so you don't have to reset them again. Enter:

```
NVSAVE
```

Now when you request a screen copy (by pressing the SCopy key), it will be sent to your LN03.

EPSON LQ-2500 COLOR DOT-MATRIX PRINTER

You can install the Epson LQ-2500 printer or other compatible wide-carriage color dot-matrix printers, such as the Alps ALQ324e, using the printer's RS-232-C port and either PORT 0 or PORT 1 on the 4211, or you can use the printer's Centronics-type port and the 4211's COPIER port. The advantage of using the Centronics-type connection is that the printing time is faster.

LQ-2500 at PORT 0 or PORT 1

Follow this procedure to connect a LQ-2500 to PORT 0 or PORT 1:

1. Plug the printer cable into the printer's serial port.
2. Power up the printer.
3. Connect the printer's RS-232-C communications cable to the PORT 0 or PORT 1 connector on the Graphics Module. Secure the RS-232-C cable connector to the port by tightening the two small connector screws.
4. Set the 4211 to use a LQ-2500 connected to the serial port and select port communications settings:

- a. Enter Setup (press the Setup key) and issue the HCINTERFACE command to tell the 4211 which port the printer is connected to by entering:

- For PORT 0, enter:

```
HCINTERFACE 16
```

- For PORT 1, enter:

```
HCINTERFACE 17
```

- b. Enter the following communications commands. For this example, we assume that you are connecting the printer to PORT 1; if you are connecting to PORT 0, substitute P0 wherever you see P1. The communications settings we are making here (9600 baud, one stop bit, no parity) assume that the LQ-2500 is at its factory-default settings. The User Manual provided with the LQ-2500 describes these communications settings in detail.

```
PASSIGN P1:,PPORT
PBAUD P1:,9600
PBITS P1:,1,8
PPARITY P1:,NONE
PFLAG P1:,CHAR
```

- c. Save the setting in nonvolatile memory by entering:

```
NVSAVE
```

- d. Exit Setup (press the Setup key).

LQ-2500 at COPIER Port

Use the following procedure to install the LQ-2500, using the printer's Centronics-type port and the 4211's COPIER port:

1. Plug the printer cable into the parallel port on the printer.
2. Plug the other end of the printer cable into the COPIER port on the Graphics Module. Secure the cable connector with the two clips attached to the port.
3. Power up the printer.
4. Set the 4211 to use a LQ-2500 connected to the COPIER port:
 - a. Enter Setup (press the Setup key) and issue the HCINTERFACE command to tell the 4211 which printer is connected to it by entering:

HCINTERFACE 18
 - b. Save the setting in nonvolatile memory by entering:

NVSAVE
 - c. Exit Setup (press the Setup key).

HEWLETT-PACKARD DESKJET PRINTER

You can install the DeskJet using the printer's RS-232-C port and either PORT 0 or PORT 1 on the 4211, or you can use the printer's Centronics-type port and the 4211's COPIER port. The advantage of using the Centronics-type connection is that the printing time is faster.

DeskJet at PORT 0 or PORT 1

Follow this procedure to connect a DeskJet to PORT 0 or PORT 1:

1. Plug the printer cable into the printer's serial port.

NOTE

The DeskJet requires an RS-232-C cable with male connectors on both ends. Pins 1, 2, 3, and 7 must be straight-wired—that is, Pin 3 on one connector must be wired to Pin 3 on the opposite connector. You can order a suitable cable through Hewlett-Packard.

2. Power up the printer.
3. Connect the printer's RS-232-C communications cable to the PORT 0 or PORT 1 connector on the Graphics Module. Secure the RS-232-C cable connector to the port by tightening the two small connector screws.
4. Set the 4211 to use a DeskJet connected to the serial port and select port communications settings:
 - a. Enter Setup (press the Setup key) and issue the HCINTERFACE command to tell the 4211 which port the printer is connected to by entering:
 - For PORT 0, enter:

HCINTERFACE 21
 - For PORT 1, enter:

HCINTERFACE 22

- b. Ensure that the DeskJet is at its factory-default communications settings (9600 baud, one stop bit, no parity) and that the HP Roman8 font is selected — that is, that the four DIP-switches in the left bank in the recessed panel below the paper tray are set to *down, down, down, up*. The User Manual provided with the DeskJet describes these switch settings in detail.
- c. Enter the following communications commands. For this example, we assume that you are connecting the printer to PORT 1; if you are connecting to PORT 0, substitute P0 wherever you see P1.

```
PASSIGN P1:,PPORT
PBAUD P1:,9600
PBITS P1:,1,8
PPARITY P1:,NONE
PFLAG P1:,CHAR
```

- d. Save the setting in nonvolatile memory by entering:


```
NVSAVE
```
- e. Exit Setup (press the Setup key).

DeskJet at COPIER Port

Use the following procedure to install the DeskJet, using the printer's Centronics-type port and the 4211's COPIER port:

1. Plug the printer cable into the parallel port on the printer.
2. Plug the other end of the printer cable into the COPIER port on the Graphics Module. Secure the cable connector with the two clips attached to the port.
3. Power up the printer.
4. Set the 4211 to use a DeskJet connected to the COPIER port:
 - a. Enter Setup (press the Setup key) and issue the HCINTERFACE command to tell the 4211 which printer is connected to it by entering:


```
HCINTERFACE 23
```
 - b. Save the setting in nonvolatile memory by entering:


```
NVSAVE
```
 - c. Exit Setup (press the Setup key).

HEWLETT-PACKARD LASERJET+ AND LASERJET SERIES II PRINTERS

You can install the LaserJet+ or LaserJet Series II using the printer's RS-232-C port and either PORT 0 or PORT 1 on the 4211, or you can use the printer's Centronics-type port and the 4211's COPIER port. The advantage of using the Centronics-type connection is that the printing time is faster.

LaserJet at PORT 0 or PORT 1

Follow this procedure to connect a LaserJet+ or LaserJet Series II to PORT 0 or PORT 1:

1. Select the printer's serial port:
 - For the LaserJet+:
 - a. Power down the printer.
 - b. Remove the back of the printer.
 - c. Behind the vertical support bracket at the back center of the printer, there is a small set of DIP switches, called SW1. With the tip of a pencil or pen, move the leftmost DIP switch backward (away from the inside of the printer) as shown in Figure 2-19.
 - d. Replace the back panel.
 - For the LaserJet Series II:
 - a. Take the printer off line.
 - b. Hold down the printer's MENU key for six seconds and then release it to display the first menu selection; press the menu key twice again to display the I/O=SERIAL* or I/O=PARALLEL* setting.
 - c. If the setting displayed is I/O=PARALLEL*, press the + key to select I/O=SERIAL* (if the setting is already I/O=SERIAL*, skip to the next step).
 - d. Press the RESET MENU key to save the selection
 - e. Return the printer online.

2. Plug the printer cable into the printer's serial port.

NOTE

The LaserJet+ and LaserJet Series II require an RS-232-C cable with male connectors on both ends. Pins 1, 2, 3, and 7 must be straight-wired — that is, Pin 3 on one connector must be wired to Pin 3 on the opposite connector. You can order a suitable cable through Hewlett-Packard.

3. Power up the printer.
4. Connect the printer's RS-232-C communications cable to the PORT 0 or PORT 1 connector on the Graphics Module. Secure the RS-232-C cable connector to the port by tightening the two small connector screws.
5. Set the 4211 to use a LaserJet connected to the serial port and select port communications settings:
 - a. Enter Setup (press the Setup key) and issue the HCINTERFACE command to tell the 4211 which port the printer is connected to by entering:
 - For PORT 0, enter:
`HCINTERFACE 5`
 - For PORT 1, enter:
`HCINTERFACE 6`
 - b. Enter the following communications commands. For this example, we assume that you are connecting the printer to PORT 1; if you are connecting to PORT 0, substitute P0 wherever you see P1. The communications settings we are making here (9600 baud, one stop-bit, no parity) assume that the LaserJet is at its factory-default settings. The User Manual provided with the LaserJet explains how to set these communications settings.

```
PASSIGN P1:,PPORT
PBAUD P1:,9600
PBITS P1:,1,8
PPARITY P1:,NONE
PFLAG P1:,CHAR
```

- c. Save the setting in nonvolatile memory by entering:
`NVSAVE`
- d. Exit Setup (press the Setup key).

LaserJet at COPIER Port

Use the following procedure to install the LaserJet, using the printer's Centronics-type port and the 4211's COPIER port:

1. Select the printer's parallel interface:
 - For the LaserJet+:
 - a. Power down the printer.
 - b. Remove the back of the printer.
 - c. Behind the vertical support bracket at the back center of the cabinet, there is a small set of DIP switches, called SW1. With the tip of a pencil or pen, move the leftmost DIP switch forward (toward the inside of the printer) as shown in Figure 2-19.
 - d. Replace the back panel.
 - For the LaserJet Series II:
 - a. Take the printer off line.
 - b. Hold down the printer's MENU key for six seconds and then release it to display the first menu selection; press the menu key twice again to display the I/O=SERIAL* or I/O=PARALLEL* setting.
 - c. If the setting displayed is I/O=SERIAL*, press the + key to select I/O=PARALLEL* (if the setting is already I/O=PARALLEL*, skip to the next step).
 - d. Press the RESET MENU key to save the selection
 - e. Return the printer online.
2. Plug the printer cable into the parallel port on the printer.
3. Plug the other end of the printer cable into the COPIER port on the Graphics Module. Secure the cable connector with the two clips attached to the port.
4. Power up the printer.

5. Set the 4211 to use a LaserJet connected to the COPIER port:

- a. Enter Setup (press the Setup key) and issue the HCINTERFACE command to tell the 4211 which printer is connected to it by entering:

HCINTERFACE 7

- b. Save the setting in nonvolatile memory by entering:

NVSAVE

- c. Exit Setup (press the Setup key).

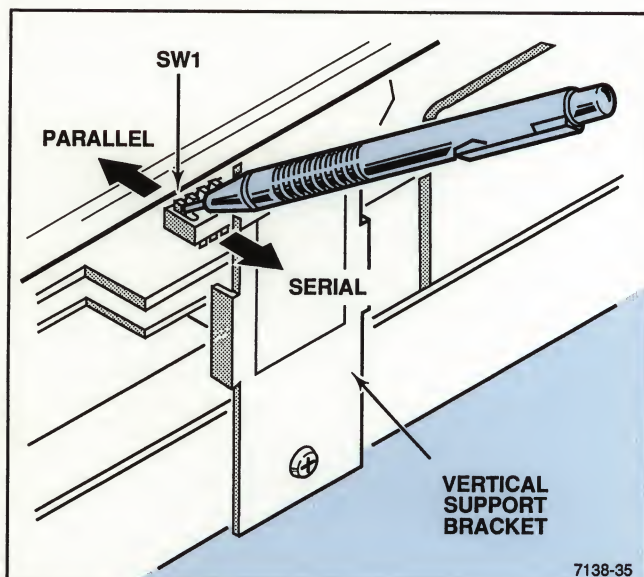


Figure 2-1. Selecting the Serial or Parallel Interface for the LaserJet+.

HEWLETT-PACKARD THINKJET

Follow this procedure to install a ThinkJet Printer:

1. Plug the printer cable into the COPIER port. Secure the cable connector with the two clips attached to the port.
2. Enter Setup (press the Setup key) and then tell which printer is connected by entering:

HCINTERFACE 4

The parameter (4) tells the 4211 that you are using a Hewlett-Packard ThinkJet and that the printer uses and understands the American and HP Supplemental character sets.

3. Instruct the 4211 to send a Carriage Return/Line Feed combination at the end of each line by entering:

HCMONochrome 1

4. Save the settings in nonvolatile memory by entering

NVSAVE

5. Now, set the Mode Select switch settings at the back of the printer to the positions shown in Table 2-1.

Table 2-20
THINKJET SWITCH SETTINGS

Switch	Setting
1	down
2	up
3	down
4	down
5	up
6	up
7	down
8	down

TEKTRONIX 4662 INTERACTIVE DIGITAL PLOTTER

1. Connect the plotter's RS-232-C cable from the modem connector on the rear of the plotter to the Graphic module's PORT 0 or PORT 1 port. (For this discussion, we'll assume the plotter is connected to PORT 0.)
2. Set the plotter's RS-232-C switch settings located on the rear panel. Table 2-2 shows one way to set the 4662 Plotter's switches: this configuration is recommended for communicating with the 4211.

Table 2-2
4662 PLOTTER SETTINGS

Switch	Setting	Communications Parameter
A	3	CR generates LF No flagging
B	3	Number of stop bits is 1
C	2	Address is A No parity
D	3	Baud rate is 1200

3. Power up the 4211.
4. Use Setup commands to configure the peripheral port. Enter Setup (press the Setup key) and then enter these commands:

```
PASSIGN P0:,4662
PFLAG P0:,NONE
PBITS P0:,1,8
PPARITY P0:,NONE
PBAUD P0:,1200
NVSAVE
```

If the plotter is connected to PORT 1, use *P1* instead of *P0* in the above commands.

5. Power up the plotter and prepare its pen and paper for use.

Other plotter settings may be used: check with your systems programmer. Be sure to configure the 4211's port to match the plotter settings.

Configuring a 4662 Plotter With Option 31 If you have a 4662 with Option 31, the multiple-pen plotter, follow the steps for the 4662, but use this PASSIGN command instead:

```
PASSIGN P0:,4662/MP
```

If the plotter buffer overflows, you should use DC1/DC3 flagging (available only if you have Option 31). Enter this PFLAG command instead:

```
PFLAG P0:,CHAR
```

If you use other plotter settings, be sure to configure the 4211's port to match.

TEKTRONIX 4663 INTERACTIVE DIGITAL PLOTTER

1. Connect the plotter's RS-232-C cable from the modem connector on the rear of the plotter to the Graphic module's PORT 0 or PORT 1 port. (For this discussion, we'll assume the plotter is connected to PORT 0.)
2. Set the plotter switches. Table 2-3 shows one sequence of 4663 parameter settings for communicating with the 4211. Settings not shown in the table should be set to the plotter's power-up defaults.

Table 2-3
4663 PLOTTER SETTINGS

Parameter	Setting
Output Terminator	CR
Attention Character	<ESC>
Interface Functions	CR GENERATES LF DEL IGNORE
Communications Control Mode	FULL DUPLEX
Receive Parity	IGNORE
Transmit Parity	LOGIC 0
Character Format	8 DATA BITS 1 STOP BIT
Transmit Baud Rate	9600
Receive Baud Rate	9600
Serial Device Address	A
Initial Command/Response Format	3 (emulates a 4662)
Interface Select	1 (RS-232-C interface)
Initial Axis Orientation	Y vertical, X horizontal
Initial Aspect Ratio	4X:3Y

3. Power up the 4211.
4. Use Setup commands to configure the peripheral port. Put the 4211 in Setup and enter the following commands:

```
PASSIGN P0:,4663
PFLAG P0:,NONE
PBITS P0:,1,8
PPARITY P0:,NONE
PBAUD P0:,9600
NVSAVE
```

If the plotter is connected to PORT 1, use *P1* instead of *P0* in the above commands.

5. Power up the plotter and prepare its pen and paper for use.

Other plotter settings may be used: for example, you could use DC1/DC3 flagging. If you use other plotter settings, be sure to configure the 4211's port to match.

HPGL-COMPATIBLE PLOTTERS

Use the following procedures to connect an HPGL-compatible plotter to the 4211:

1. Connect the RS-232-C cable from the RS-232-C connector on the rear of the plotter to PORT 0 or PORT 1 port on the 4211. (For this discussion it is assumed that the plotter is connected to PORT 0.)
2. Set the plotter switches. Table 2-4 shows one sequence of suggested settings for communicating with the 4211. Consult the plotter manual for instructions on how to set these and other parameters.
3. Power up the 4211.
4. Configure the peripheral port by putting the 4211 in Setup and entering the following commands:

```
PASSIGN P0:,HPGL
PFLAG P0:,CHAR
PPARITY P0:,NONE
PBITS P0:,1,8
PBAUD P0:,9600
NVSAVE
```

When setting the baud rate, data and stop bits, and parity, you can use settings other than those suggested in this example. However, the settings you use on the 4211 must match those on the plotter.

5. Power up the plotter and prepare its pen and paper for use — see the plotter manual for instructions.

Table 2-4
HPGL-COMPATIBLE PLOTTER SETTINGS

Parameter	Setting
Baud rate	9600
Parity	none
Character format	8 data bits 1 stop bit
Handshaking	XON/XOFF
Bypass mode	off
Duplex	full

TEKTRONIX 4957 AND 4958 GRAPHICS TABLETS

Use the following procedure to install your Tektronix tablet.

1. Connect the puck or stylus cable to the tablet.
2. Connect the tablet's communications cable to either PORT 0 or PORT 1 connector on the rear of the Graphics module.
3. Enter Setup (press the Setup key).
 - If you have a 4957 connected to PORT 0, enter:
`PASSIGN P0: 4957`
 - If you have a 4958 connected to PORT 0, enter:
`PASSIGN P0: 4958`

(If you are using the optional stylus as input device for your tablet, specify "4957/S" or "4958/S" instead.)
4. Save the setting in nonvolatile memory by entering:
`NVSAVE`
5. Plug in the tablet's power cord to a standard power outlet.

TEKTRONIX 4510A COLOR GRAPHICS RASTERIZER

1. Connect the rasterizer's RS-232-C communications cable to the Graphics module's PORT 0 or PORT 1 port. (For this discussion, we'll assume the rasterizer connected to PORT 0: if you are connecting to PORT 1, substitute *P1* wherever you see *P0*.) Secure the RS-232-C cable connector to the port by tightening the two small connector screws.
2. Connect the 4690 Series Copier to the rasterizer, and turn on both the rasterizer and copier.
3. When you connect the copier, you must set the port settings to communicate with the rasterizer. Following are the factory default settings of the rasterizer. Enter Setup (press the Setup key) and then enter:

`PASSIGN P0: , 4510`
`PBAUD P0: , 9600`
`PPARITY P0: , NONE`
`PFLAG P0: , CHAR`
`PBITS P0: , 1, 8`
4. Save the setting in nonvolatile memory by entering:

`NVSAVE`

Your hardware installation is complete. Refer now to Section 4 for information on configuring for host communications.

Section 3

GETTING ACQUAINTED

This section will help you become familiar with some of the features of your 4211 Graphics Netstation. The following list gives you an overview of what you can expect to find in this section.

- If you are using a Tektronix terminal for the first time and would like to become familiar with some basic information about your 4211 Netstation, see "4211 Overview."
- A special operating mode allows you to enter English-style commands from the keyboard to control the 4211's operating characteristics. When the 4211 is in Setup, you can enter commands to change 4211 settings, display status or help messages, and make copies of the display — in other words, you can use any command that has Setup syntax. These commands have English-style names that describe their purpose, such as *DALINES*, which sets the number of lines displayed in the dialog area. If you would like an introduction to Setup, refer to "Using Setup Commands."
- Two display areas separate non-graphics text from graphics. For information, see "Viewing the Dialog and Graphics Areas."
- Your 4211 drives a wide range of printers to give you hardcopies of your graphics and text. For information, refer to "Making Copies."
- An easy menu interface gives you access to additional 4211 functions. For an introduction, see "Using the Menu Interface."
- The 4211 has up to three options for host communication. For information, see "Host Communications Ports."
- You can select Tek graphics capability or DEC editing capability using the Tek key. If you need information, see "Keyboard Functionality."

NOTE

All information, instructions, and responses with shaded gray background (as shown here) refer only to the 4211 with the coax option.

4211 OVERVIEW

Your 4211 Graphics Netstation includes a Display module, a keyboard, and a Graphics module. You may also have a mouse or thumbwheels connected to your keyboard. Refer to Figure 3-1 for hardware identification.

The Display module receives video output from the Graphics module and displays it on the screen.

The Graphics module gets data from a host or the keyboard and processes it for the Display module.

The VT200-style keyboard contains ASCII keys, programmable function keys, a numeric keypad, and a multipurpose cursor pad to scroll text and control the graphics cursor. Snap-down legs under the keyboard adjust the keyboard angle.

The optional coax keyboard provides IBM 3179G/31923G, DEC VT200, and Tektronix 4200 keyboard functionality.

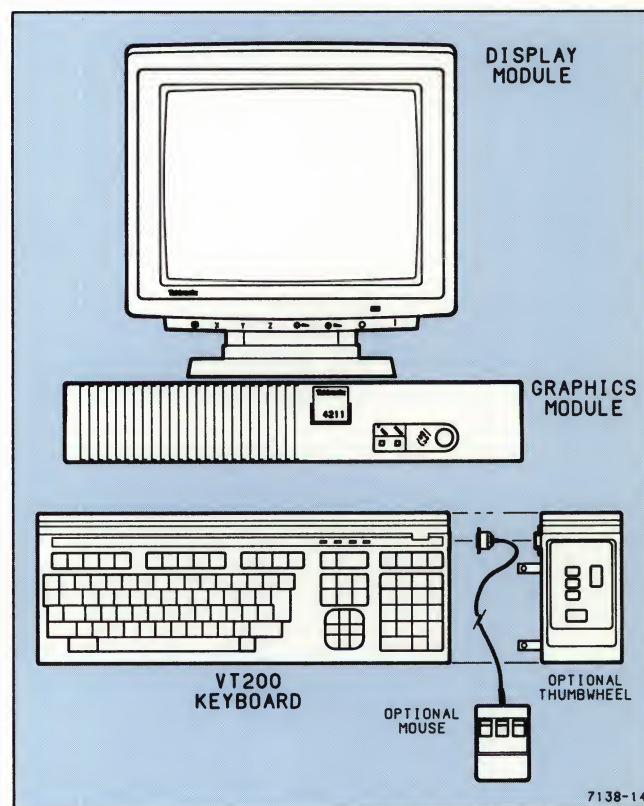


Figure 3-1. 4211 Graphics Netstation.

POWERING UP

If the 4211 is not powered up and you see no cursor on your screen, press the POWER switch on the front of your Display module and the POWER switch on the front of the Graphics module. Wait a few seconds while the 4211 goes through a series of tests.

If you are connected to a host you will probably see a computer login prompt appear when Power Up Self Test is done. If you are not connected to a host, a cursor will be displayed. Refer to Appendix B for Self Test information.

If your screen is blank and the 4211 is powered up, locate the BRIGHTNESS knob on the front of the Display module and turn it clockwise.

Next

If you need information about using Setup, go on to the next discussion.

Perhaps you are ready to log into your computer and run an application program. Check with your systems analyst for log in information.

USING SETUP COMMANDS

Setup is useful for checking settings and for configuring host and peripheral communications.

Press the Setup key to enter Setup (refer to Figure 3-2). In Setup, the Display module displays an asterisk prompt followed by a cursor.

NOTE

If your host also uses the asterisk as a prompt, it may be difficult to tell whether you are in Setup or communicating with your host. Press the Setup key again—if the cursor moves to a new line and displays the asterisk, you're in Setup. If a new asterisk is not displayed, press the Setup key again to enter Setup.

During Setup, control characters that don't have editing functions in Setup are displayed rather than executed. For example, pressing the Escape key would display Esc , but pressing the Return [Enter on the coax keyboard] key would execute a Carriage Return, an editing character.

If you enter Setup from the Zoom/Pan function, Zoom/Pan is terminated. Any other operation (such as host communication) will be suspended when you enter Setup and resumed when you exit.

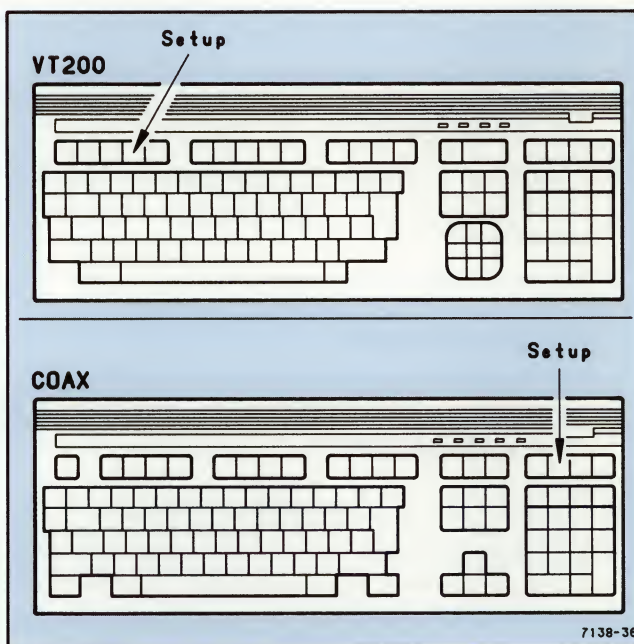


Figure 3-2. Setup Key.

ENTERING COMMANDS

You enter a Setup command by typing it on the keyboard and pressing the Return [Enter on the coax keyboard] key.

Most Setup commands consist of three parts:

- The *command name* specifies the operation you want to perform or the type of setting you want to change.
- One or more *parameters* define the exact action of a command; parameters always follow the command name. Parameters must match what the 4211 expects. Refer to the *4210 Series Command Summary* for more parameter type information.

A parameter can be a keyword, such as *YES* or *NO*, or an integer value, such as 0, 1, 2, or 3. Parameters can also be a real number, such as 3.2 or 10.7, or an array, such as <13,14> or <3,4,5>. A parameter can be a delimited string, several characters which begin and end with the same *delimiter*, such as *24* or /BLOCK/. They can also be a key specifier; for example to define function key F1 to be the string HELLO, you could enter *DEFINE F1 /HELLO/*.

- The *command terminator*, which is the C_R (Carriage Return) control character entered by pressing the Return [Enter on the coax keyboard] key.

Some Setup commands perform a particular action, like drawing a line. Other Setup commands establish *settings*, like the maximum number of lines the 4211 can display in its dialog area. (The *4210 Series Command Summary* describes the function of each Setup command.)

The settings determine *operating characteristics*, that is, how the 4211 responds to commands and displays information.

Here's an example of a Setup command:

```
DAINDEX 1,3,0
```

DAINDEX is the command name. Its function is to set the color indices of the dialog area. 1, 3, and 0 are parameters. Each parameter in this command is a number that corresponds to a specific color index.

To specify more than one parameter in a command, use one or more spaces or a comma to separate the parameters. For example, the following commands both correctly specify the same settings:

```
DAINDEX 1,3,0
```

```
DAINDEX 1 3 0
```

(For clarity in this manual, we've used commas to separate parameters.)

If you don't enter all the required parameter values, the omitted parameters assume their *omitted* default values:

- If the parameter is the only one in the command, or is the last of two or more parameters, you simply omit it. For instance, since 0 is the omitted default for the third parameter in the *DAINDEX* command, these two entries specify the same settings:

```
DAINDEX 1,3,0
```

```
DAINDEX 1,3
```

- To omit a parameter other than the last one, use commas to separate the location of the omitted parameter from adjacent parameters. For example, to omit the first parameter of the *DAINDEX* command, you would enter:

```
DAINDEX ,3,0
```

To omit the second parameter, you would enter:

```
DAINDEX 1,,0
```

The *4210 Series Command Summary* shows the defaults for all Setup commands.

Each time you press the Return [Enter on the coax keyboard] key to end a command, the 4211 executes the command, goes to a new line, and displays an asterisk to prompt for the next command.

CORRECTING COMMAND ENTRY ERRORS

If you notice a mistake in a Setup command before you press the Return [Enter on the coax keyboard] key, press the Del key to back up and erase the error. You can also enter Ctrl-X to erase the entire command line, and then reenter the command. To enter *Ctrl-X*, hold down the Ctrl key and press the X key — don't type the hyphen.

If you make a mistake and you've already pressed the Return [Enter] key, just reenter the command correctly. For instance, if you discover that you entered the wrong parameters for a command, simply enter the command again with the correct parameters. For most commands, the last entry overrides any previous entry.

UNDERSTANDING ERROR MESSAGES

When you enter a Setup command incorrectly, the 4211 displays an error message that helps you identify the type of error. In many cases, the 4211 displays a string of asterisks below the incorrect portion of the command to help you locate the error.

For example, suppose you want to change the size of the dialog area and you accidentally enter *DALANES* instead of *DALINES*. The 4211 would display the following error message:

```
*DALANES 6
*****
>> Graphics System Detects Error: \
    Nonexistent Command
```

Should you make an error entering the parameters of a command, the 4211 may display asterisks below the parameter that caused the error. For example, say you enter a *DALINES* command with two parameters instead of one. *DALINES* requires only one parameter, so the error message appears as follows:

```
*DALINES 20,8
**
>> Graphics System Detects Error: \
    Extraneous Input
```

The message tells you that you entered too many parameters for the command; the asterisks locate the extraneous input — the comma and the 8.

GETTING HELP FOR SETUP COMMANDS

The 4211 can display a one-line help message for each Setup command. This message can help you recall Setup command names and the kind of parameters you need to enter. (The HELP message also gives the command's opcode, which is used for host syntax.)

The HELP command has several variations (the 4211 must be in Setup):

- You can ask for all help messages by entering just:

```
HELP
```

The complete help message is rather lengthy. You can press the cursor pad [arrow keys] to scroll back up into the help message. Press the Shift key while using the cursor pad to speed up scrolling.

Use Ctrl-S and Ctrl-Q to stop and restart the output.

- If you want the help message for a specific Setup command, you can either:
 - Enter *HELP* followed by the command name — for example:

```
HELP FILLPATTERN
```

- Enter enough characters to uniquely identify the command — for example:

```
HELP FIL
```

- Most commands that share a similar function have the same first two letters. When you want help for all commands that begin with the same two letters, enter the HELP command followed by the first two letters of the commands — for example:

```
HELP DA
```

This example would display the status of all *dialog area* commands. Other combinations include *HC* for hard copy commands, *SG* for segment commands, *GI* for graphics input commands, *GT* for graphtext commands, and *PX* for pixel commands.

- Cluster names identify specific categories of commands. To display messages for these related commands, enter one of the *cluster names* that appear in the complete HELP message. The cluster names are:

- ANSI
- Coax (with coax option)
- Communications
- Dialog
- General
- GIN
- Graphics
- Hardcopy
- Keyboard
- LAN
- Pixels
- 2PPI
- Report/Input
- Segments
- Surfaces
- Views

For example, to get help for all commands affecting the keyboard, you would enter:

```
HELP KEYBOARD
```

GETTING STATUS FOR SETUP COMMANDS

You can display the settings of commands by using the STATUS command. This command displays the Setup command name and the current settings of that command.

The STATUS command works just like the HELP command. See the previous discussion for the various ways you can query for command status.

SAVING COMMAND SETTINGS

Nonvolatile commands are commands whose settings you can save in *nonvolatile memory* — memory that is retained even when you turn off the 4211. Saved commands are automatically in effect whenever you turn on or *reset* the 4211. (You can reset the 4211 by pressing the RESET button on the front of the Graphics module, by issuing a RESET command, or by turning the Graphics module off and on again. Reset is described further in "How to Reset the 4211" in Section 7.)

During installation, you usually save all the communications commands that establish the communications link between the 4211 and the host computer and between the 4211 and peripheral devices.

To save commands in nonvolatile memory, enter an NVSAVE command after issuing the commands you want to save. Entering an NVSAVE command at the end of the following command sequence would store the two commands above it in nonvolatile memory:

```
ACURSOR 3,6
DAINDEX 0,3,3
NVSAVE
```

The settings established by the two saved commands — the dialog area cursor color and the dialog area colors — would be in effect whenever you turn on or reset the 4211.

You can temporarily change the settings of any of these commands by entering the command with different parameters, but not issuing NVSAVE.

Whenever you issue an NVSAVE command, it saves the most recent settings of *all* commands that can be saved in nonvolatile memory and that have changed since the last NVSAVE. Therefore, before issuing NVSAVE, consider *all* the commands you used during a session. Keep in mind that if you issue NVSAVE after running a host application program, you may be saving some commands that the application issues, making the 4211 incompatible with other applications. Further, you may inadvertently override some of your saved commands as well.

The NVSAVE command also saves any nonvolatile *macros* that have been defined since the last NVSAVE. (Macros are discussed later in this section.)

CAUTION

After you enter an NVSAVE command, wait for the asterisk () to appear before taking any further action. If you turn off or reset the 4211 while NVSAVE is working, all parameters will be reset to their factory default values.*

There are many settings that cannot be saved with an NVSAVE command. Turning the 4211 off or resetting it causes these commands to return to their factory default values. The *4210 Series Command Summary* shows in a table which commands can be saved in nonvolatile memory.

Saving LAN Settings

There is another command which you only use in setting up local area network (LAN) communications. The SAVEADDRESSES command saves the internal network tables in nonvolatile memory. Like the NVSAVE command, saved addresses are automatically in effect when you turn on or reset the 4211.

Next

If you want information on the two parts of the screen, the dialog area and the graphics area, continue with the next discussion.

VIEWING THE DIALOG AND GRAPHICS AREAS

You can think of the screen as having two panes of glass (see Figure 3-3). On the front pane is the *dialog area*, which contains dialog — communication between you and the graphics system, such as Setup commands, or between you and an applications program running on a host computer.

On the other pane is the *graphics area*, which displays your graphics.

The purpose of the dialog area is to keep text that is not part of a graphics image from obscuring the graphics.

These two panes in one allow you to work with text in the dialog area and with images in the graphics area. You can view these areas together or separately. Your keyboard has several keys which control the visibility of the screen display.

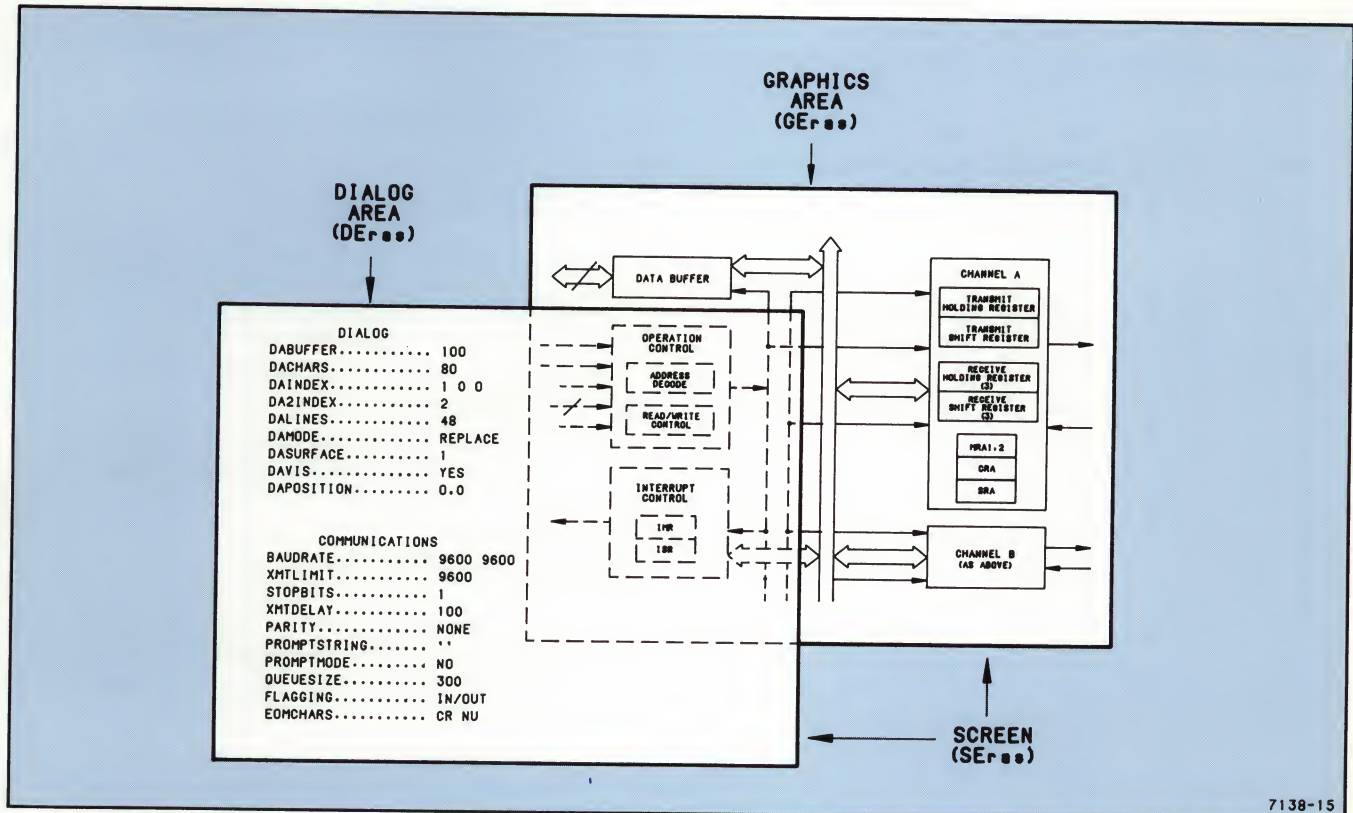


Figure 3-3. Dialog and Graphics Areas.

Screen Visibility Keys

You'll notice the GErAs, Dialog, DErAs, and SErAs keys (see Figure 3-4). These keys control what you see on the screen. Pressing the Dialog key once turns the dialog visibility off. Pressing it again toggles the visibility on.

Try pressing the Dialog key. Your prompt, cursor and any commands you entered in the dialog area will disappear. Pressing the Dialog key again will toggle the visibility on.

The GErAs, DErAs, and SErAs keys work a bit differently from the Dialog key.

- Dialog toggles the dialog visibility on and off. Pressing the Dialog key will always return your cursor, no matter where in the buffer you are.
- GErAs (Graphics Erase) erases only the images in the graphics area that are not defined as segments. (A segment is an image that has been defined as a unit so it can be treated as a single object.)

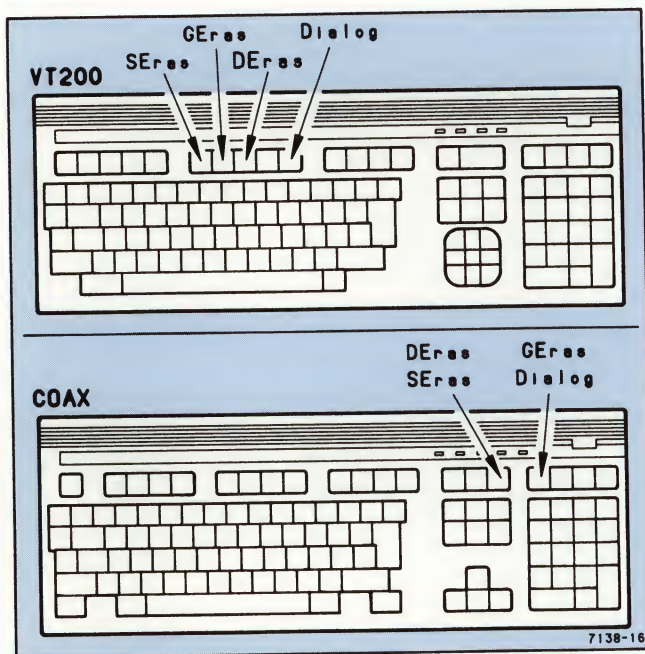


Figure 3-4. Screen Visibility Keys.

- DErAs (Dialog Erase) erases the dialog area, leaving only the cursor. To restore the prompt, press the Return [Enter] key.
- SErAs (Screen Erase) erases the dialog area and the images in the graphics area that are not defined as segments. To restore the prompt, press the Return [Enter] key.

To erase all segments from the screen, use the following steps.

1. Press the Setup key.
2. Delete the segments by entering:
`SGDEL -1`
3. Press the SErAs key to erase the segment.

Scrolling the Dialog Area

The dialog area may include text which is not visible on the screen. This area is called the dialog area buffer and normally contains 128 lines (32 lines in coax). To view text in your dialog area buffer, press your cursor pad (arrow keys on the coax keyboard). Your cursor will move in the same direction.

For information on changing dialog area characteristics (including the number of lines in your dialog area buffer), see Section 7.

Next

In addition to viewing the dialog and graphics areas, you can make hardcopies of whatever is on the screen. The next discussion introduces the copy function and associated keys.

MAKING COPIES

You may have a copier or printer connected to your 4211. This allows you to copy whatever is on the screen to either paper or transparency (see Figure 3-5). Refer to Section 2 for installation information as needed.

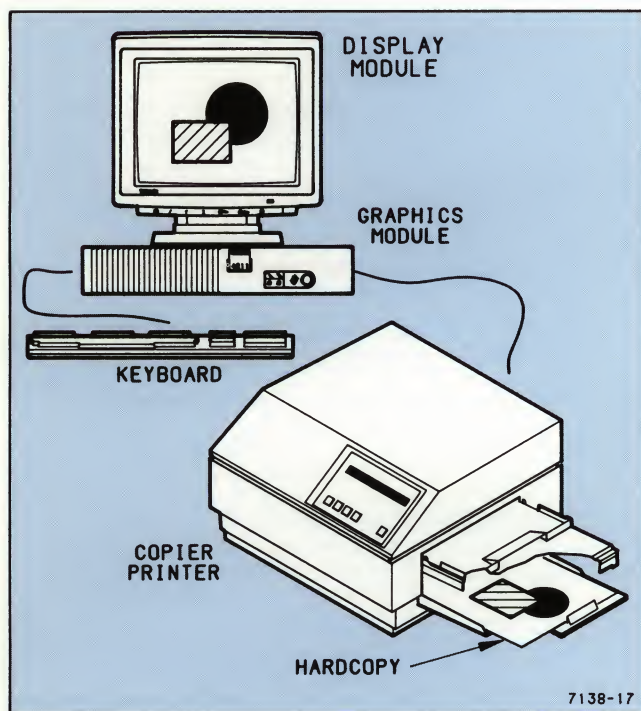


Figure 3-5. 4211 and Printer.

Copy Keys

Your keyboard includes DCopy and SCopy keys (see Figure 3-6) for copying either the dialog area or whatever is displayed on the screen. To use the DCopy and SCopy keys:

- Press the DCopy key to copy the display on the dialog area of your screen.
- Press the SCopy key to copy both dialog and graphics, whatever is displayed.
- To copy just the graphics area, use the Dialog key (discussed previously in "Screen Visibility Keys") to make the dialog area invisible, and then press the SCopy key.

Refer to Section 5 for more information on making copies.

Next

The 4211 features a simple method of accessing other functions. The next discussion introduces the menu interface.

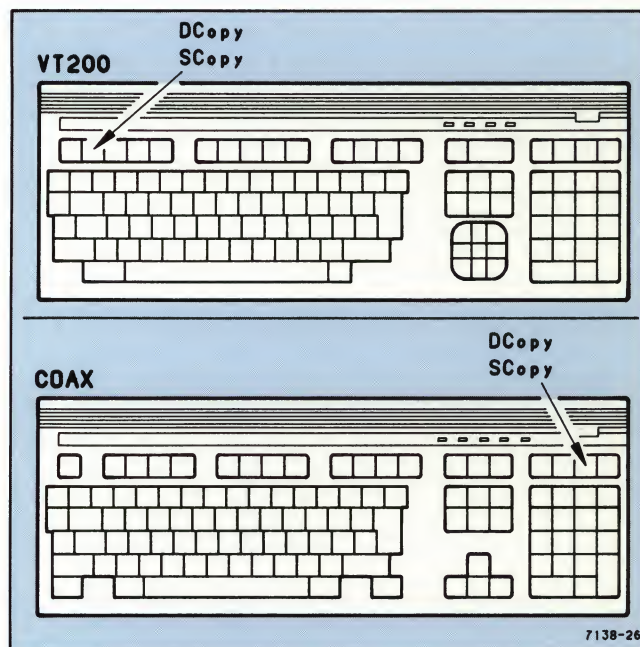


Figure 3-6. Copy Key.

USING THE MENU INTERFACE

Your 4211 features a Menu interface with access to other functions. When you press the Menu key (see Figure 3-7), a banner including the Zoom/Pan function and the Coax Configuration Menu (if you have the coax option) appears at the bottom of your screen:

- The Zoom/Pan function allows you to select a portion of a graphic image and enlarge it for a more detailed view. Press the Menu key and then the F2 key to access Zoom/Pan. Refer to "Using Zoom/Pan" in Section 6 for more information.
- If you have the coax option this interface allows you to select and run several sessions. Press the Menu key and then the F3 key to access the Coax Configuration Menu. Refer to "Configuring the 4211 for DFT Mode" in Section 4 for more information.

Next

Your 4211 can receive and send host communications through several ports. The next discussion gives you more information.

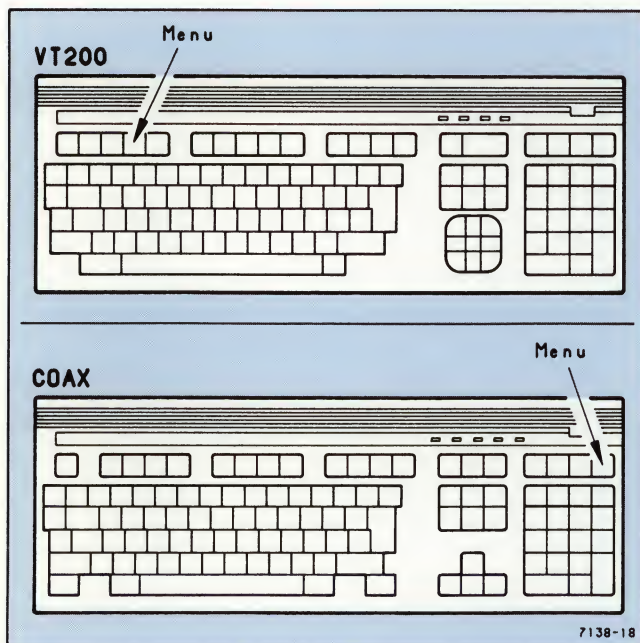


Figure 3-7. Menu Key.

HOST COMMUNICATIONS PORTS

If you have the Local Area Network (LAN) option or the Coax option, your 4211 will be able to communicate in up to three different ways (see Section 4 for setting up communications):

- If you are using RS-232 communications, your 4211 is sending and receiving host information through the COMPUTER port.
- If you are using Coax communications, your 4211 is sending and receiving host information through the COAX port. Coax communications makes the 4211 compatible with IBM terminals and allows you to run IBM GDDM graphics application programs.
- If you are using LAN communications, your 4211 is sending and receiving host information through the LAN port. LAN communications gives the opportunity to set up communications, through the Telnet interface, with a variety of host computers and terminals.

If you have the Coax option, you can easily switch ports using either of the following methods:

1. Use the HOSTPORT command.

- For example, if you want to switch to Coax communications, press the Setup key and then enter:

```
HOSTPORT COAX
```

- To switch from coax to LAN, enter:

```
DMAP HO: NTN  
HOSTPORT HO:
```

- To switch from LAN to coax, enter:

```
HOSTPORT COAX
```

- To switch from coax to RS-232, enter:

```
DMAP HO: SPØ  
HOSTPORT HO:
```

- Press the Setup key again. Your 4211 can now display information from whichever host you specified.

2. If you have the coax keyboard, use the Shift-Jump key combination—just hold down the Shift key while pressing the Jump key. This method will toggle you between coax and the host which has been specified in the DMAP HO: command.

See the discussion "Using Coax or LAN Option With Host Applications" in Section 8 for more information on using the coax and LAN options.

Next

Your 4211 can run VT200 applications and perform standard Tek graphics. The next discussion introduces the Tek key which allows you to switch between Tek and VT200 keyboard functionality.

KEYBOARD FUNCTIONALITY

Your keyboard can be configured to run graphics applications using special Tek keys (called Tek keyboard functionality), or configured to run VT200 applications (called VT200 keyboard functionality). VT200 applications are usually for text editing.

When the Tek key light is on (see Figure 3-8), you can perform standard Tek graphics and Tek functions. When the Tek key light is off, you can perform DEC editing and VT200 functions. To switch between VT200 and Tek keyboard functionality, press the Tek key to turn the light on (Tek), and again to turn it off (VT200). For more information on keyboard functionality, see "Switching Between VT200 and Tek Functionality" in Section 8.

The KEYMODE command affects the operation of the Tek key. Using this command you can lock the Tek key so that it will have no effect if you accidentally press it. For more information, refer to "Using KEYMODE to Lock Keys" in Section 7.

Next

If you have the coax keyboard, refer to the next discussion for an explanation of the color coding on some of the keys.

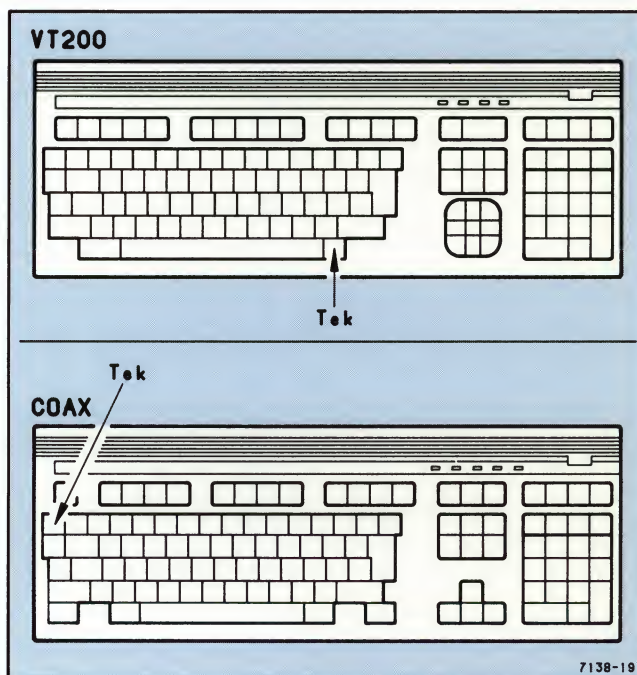


Figure 3-8. Tek Key.

COAX KEYBOARD COLOR CODES

If you have the coax option, you'll notice that your keyboard has color coded legends on some keys. These colors indicate functions that are unique to HOSTPORT COAX or HOSTPORT HO:

Here's the explanation of the colors that apply in HOSTPORT COAX:

- *Black only* — Operates similarly to IBM 3179G key or has a Tektronix-unique function that is the same for both host port connections.
- *Blue and black* — Operates according to the legend in black.
- *Blue only* — Has no predefined function; can be programmed with macro functions.

In HOSTPORT HO: the keyboard keys take on the same functions as a Tektronix 4200 Series terminal keyboard. Here's the explanation of the color-codes that apply in HOSTPORT HO:

- *Black only* — Operates as typical Tektronix 4200 Series key or is available as extra programmable function key if legend is relevant only to IBM 3179G emulation.
- *Blue and black* — Operates according to the legend in blue.
- *Blue only* — Operates according to legend.
- *Black and Red* — Key action depends on state of Tek key: key operates according to the black label when Tektronix functions are selected (that is, when Tek light is on) and according to red label when VT200 functions are selected (that is, when Tek light is off). If the black label is relevant only to IBM 3179G emulation, the red label is always used.

For more keyboard explanation, see Section 8 and Appendix A.

4211 Operator

COMMUNICATING WITH A HOST COMPUTER

ESTABLISHING COMMUNICATIONS

The 4211 Graphics Netstation is already configured by the factory for typical RS-232-C host communications, although different hosts sometimes have different requirements, in which case you might have to change certain settings. Also, if you are using a LAN you probably need to change some settings to match the settings of your host computer.

The following topics and tables supply information for setting communications parameters for RS-232-C, coax, and LAN installations. You will also find a table which addresses the general communications commands.

The third column in each table, *Available Settings*, lists the valid parameters that can be set, and the fourth column lists the *factory default settings* (the values set when the 4211 is shipped from the factory). The last column is empty so that you can record the settings required by your host computer or LAN network.

Follow these steps to configure the 4211 for communication with your host and, if appropriate, with your LAN:

1. Find out what settings are required by your host computer. Consult your host computer manuals, your computer center staff, your system programmer, or your network administrator for this information. Then, fill in these requirements in the last column of Tables 4-1 and 4-2. Use the LAN Worksheet at the back of this section if you will be accessing a local area network. (The optional *4210 Series Programmers Manual* describes RS-232-C communications concepts, coax concepts, LAN concepts, and it gives more detail about individual commands.)
2. Put the 4211 in Setup and enter the required communications commands using Tables 4-1, 4-2 and the worksheet (refer to Section 3 if you need information on how to enter Setup commands). You only need to enter those commands whose factory default settings are different from your host computer's requirements. Refer to the *4210 Series Command Summary* for the actual syntax of the required commands.
3. Display the communications settings by entering:


```
STATUS COMM
```

Check the list to make sure it matches the settings you listed in the last column of Tables 4-1 and 4-2.
4. After you set the communication parameters, save them by entering:


```
NVSAVE
```

Saved information is not erased when the 4211 is turned off. Every time you turn on the 4211, it automatically reinitializes all the factory settings and all the settings you saved with the NVSAVE command.

LAN addresses are saved using the SAVEADDRESSES command, but are loaded together with the NVSAVE parameters.

During future use of the 4211, you can temporarily change the communications settings without altering the saved settings. The 4211 reverts to those saved settings when you reset it or turn it off and back on.

GENERAL COMMUNICATIONS COMMANDS

Table 4-1 lists the general communications commands that you will use with both RS-232-C and LAN installations. The fourth column lists the *factory default settings* (the values set when the 4211 is shipped from the factory). The last column is empty so that you can record the settings you need.

Table 4-1
GENERAL COMMUNICATIONS COMMANDS

Command Name	Description	Available Settings	Factory Default Setting	Your Host Settings (fill in)
BYPASSCANCEL	Sets the bypass cancel character	Any ASCII character	^L F(ADE 10)	
CRLF	Specifies whether Carriage Return implies Line Feed	NO, YES	NO	
ECHO	Specifies whether the 4211 provides the echo to the screen	NO, YES	NO	
EOFSTRING	Specifies the string that the 4211 uses to mark the end of a file transmission	Any ASCII characters	Empty array	
EOLSTRING	Specifies the string the 4211 sends to the host in reports	Any ASCII characters	^C R(ADE 13)	
EOMCHARS	Specifies the character(s) recognized by the 4211 at the end of a line of typed data	Any ASCII character	^C R(ADE 13) and ^L F(ADE 10)	
IGNOREDEL	Specifies whether the 4211 ignores incoming Delete characters	NO, YES	NO	
LFCR	Specifies whether Line Feed implies Carriage Return	NO, YES	NO	
PROMPTMODE	Allows the host to tell the 4211 when the host is ready to receive data	NO, YES, 2	NO	
PROMPTSTRING	Specifies the string that the host sends to the 4211 to request input	Any ASCII character	?<sp>	
QUEUESIZE	Sets the number of bytes reserved for the input queue	1 — 65535	300	
XMTDELAY	Sets the transmit delay (in milliseconds) after an end-of-line or an end-of-message character	0 — 65535	100	

RS-232-C AND LAN COMMUNICATIONS

Table 4-2 lists the commands that set up RS-232-C and LAN communications with your host computer. The fourth column lists the *factory default settings* (the values set when the 4211 is shipped from the factory). The last column is empty so that you can record the settings you need.

Table 4-2
RS-232-C AND LAN COMMUNICATIONS COMMANDS

Command Name	Description	Available Settings	Factory Default Setting	Your Host Settings (fill in)
BAUDRATE	Sets the transmit and receive rates for host communications	75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200, 38400	2400	
BREAKTIME	Sets the length of the interrupt signal (in milliseconds) generated by the Break key	0—65535	200	
DMAP	Establishes a logical connection between the specified physical device and logical device (requires LAN option)	HO: SP0, HO: NTN 0 or 2—65	HO: SP0	
FLAGGING	Specifies the handshaking protocol between the 4211 and the host	NONE, INPUT, OUTPUT, IN/OUT, DTR/CTS	NONE	
HOSTPORT	Selects the path used for communications between the host and the graphics system (requires Coax option)	COAX, HO:	COAX	
PARITY	Specifies the number of data bits (7 or 8) and the presence and use of the parity bit in characters sent to the host	7NONE, 7SPACE, 7ODD, 7EVEN, 7MARK, 8NONE, 8SPACE, 8ODD, 8EVEN	7SPACE	
STOPBITS	Sets the number of stop bits sent to the host after each character	1, 2	1	
XMTLIMIT	Sets an upper limit on the 4211's transmit rate to the host	110—38400	19200	

Troubleshooting Host Communications

If the 4211 does not work correctly with the host computer, it may be because the baud rate and/or parity setting of the 4211 is incompatible with what the host computer is sending. First, check the baud rate of the 4211 and be sure it's the same as the baud rate of the host computer. If you are unsure of the parity setting, perhaps your systems administrator can help. Otherwise, try the following, in this order:

1. Set PARITY to *7SPACE*. (That is, press the Setup key to enter Setup, type *PARITY 7SPACE* and then press the Return [Enter] key. Then exit Setup mode by pressing the Setup key again.) Now try again to communicate with the host computer.
2. If Step 1 doesn't work, try setting PARITY to *7EVEN*.
3. If Step 2 doesn't work, try setting PARITY to *7ODD*.
4. If Step 3 doesn't work, try other settings: *7MARK*, *8NONE*, *8SPACE*, *8ODD*, *8EVEN*.
5. Once you find a parity setting that works, enter Setup mode again, type *NVSAVE*, and press the Return [Enter] key to save the parity setting.

NETWORK ADMINISTRATOR INFORMATION

This discussion describes the information you will need to add users to an existing local area network (LAN). If you are an operator rather than a network administrator, skip to the topic "Local Area Network (LAN) Operator Information." Included in this discussion are:

- Local Area Network (LAN) Worksheet
- Protocol Specifications
- Internet Address Classes
- Telnet Supported Options

LAN Worksheet Information

You will find a worksheet in the back of this section. This worksheet is a suggested method for gathering the information required by both you and the user to access a network. The worksheet supplies introductory LAN information for you, the network administrator. There are several fields to be supplied by the user (terminal type, 4211 Ethernet address, host names), followed by fields to be filled in by you. When the worksheet is complete, the information can be used in entering LAN address requirements.

Each field title on the worksheet is followed by the command required for entry of information for that field. For example, the columns labeled HOST NAME and INTERNET ADDRESS are followed on the next line by (IHOSTADDRESS). The user can find the procedure for entering the host name and Internet address by referring to "Using IHOSTADDRESS to Enter the Host Internet Address" in the "Local Area Network (LAN) Operator Information" discussion later in this section.

Protocol Specifications

LAN protocols are functionally divided along the guidelines set out by the International Organization for Standardization (ISO) seven layer Open Systems Interconnection model.

Figure 4-1 defines some of the major protocol hierarchies. The Physical, Link, and Network Layer interfaces are defined respectively by Ethernet and DARPA's Internet Protocol (MILSTD-1777). Above those levels the appropriate standards that must be met depend on the application. For the network applications that will be supported by the 4211, the Layer 4 transport protocol will need to be TCP (Transmission Control Protocol) defined by DARPA as MIL-STD-1778. The hardware compatibility specification for transceivers is IEEE 802.3.

You can use a 4211 as a network terminal under the Telnet Application Layer Protocol.

Figure 4-1 tells you that Telnet requires the services of TCP — which uses IP — which uses the Ethernet Link and Physical levels. Satisfying the standardization requirements of Ethernet, IP, TCP, and Telnet should provide the required functionality for most uses.

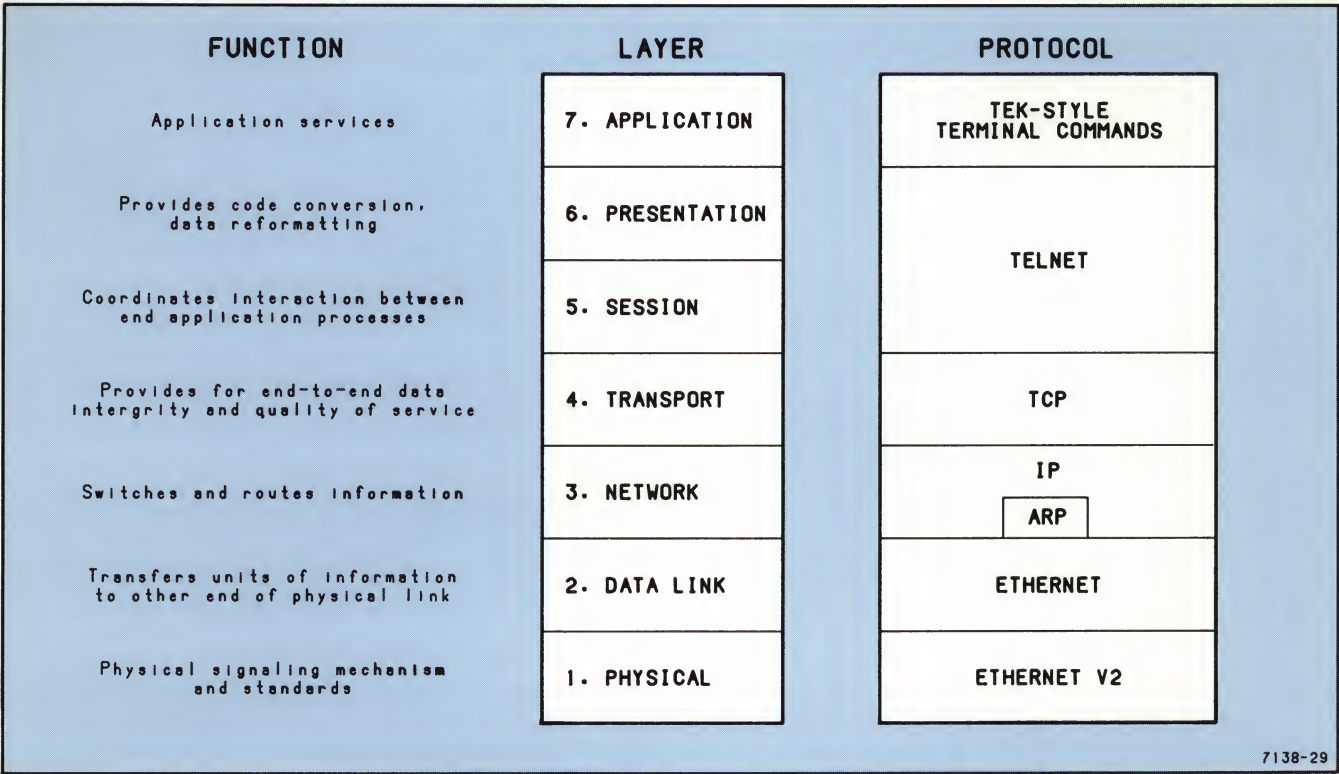


Figure 4-1. Protocol Specifications.

Telnet Supported Options

The purpose of the Telnet Protocol is to provide a bi-directional, eight-bit oriented communications facility. Its primary goal is to allow a standard method of connecting terminal devices and terminal-oriented processes to each other.

Setting up LAN

This discussion describes the commands used to set up LAN communication. Each description lists the available settings parameters, and the factory default settings (the settings already built into the 4211). The last line leaves room for you to record the settings in preparation for completing the LAN worksheet supplied at the back of this section. (See the *4210 Series Command Summary* for more information on each of the LAN commands.)

ITERMADDRESS — Sets the add flag, terminal name, Internet address and net mask. There are no default settings. Available parameters include:

1. Add flag — add, 1.
2. Terminal name — character string of 2 to 32 characters. Can include 0-9, A-Z, a-z, _, -, . (period).
3. Internet address — 7 to 15 characters in format XXX.XXX.XXX.XXX, where X is 0-9, and XXX is not greater than 255.
4. Net mask — 15 characters in the format XXX.XXX.XXX.XXX. The valid range is between 255.000.000.000 and 255.255.255.255.

Your setting is:

IHOSTADDRESS — Adds the host name and Internet address to the host table. There are no default settings. Available parameters include:

1. Add flag — add, 1, del, 0.
2. Host name — character string of 2 to 32 characters. Can include 0-9, A-Z, a-z, _, -, . (period).
3. Internet address — 7 to 15 characters in format XXX.XXX.XXX.XXX, where X is 0-9, and XXX is not greater than 255.
4. Net mask — 15 characters in the format XXX.XXX.XXX.XXX. The valid range is between 255.000.000.000 and 255.255.255.255.

Your setting is:

ILANADDRESS — Adds host Internet and Ethernet entry to the host Internet address table. There are no default settings. Available parameters include:

1. Add flag — add, 1, del, 0.
2. Internet address — 7 to 15 characters in format XXX.XXX.XXX.XXX, where X is 0-9, and XXX is not greater than 255.
3. Ethernet address — 12 to 18 characters in format XX:XX:XX:XX:XX:XX, where X is 0-9, a-f, A-F.
4. Net mask — 15 characters in the format XXX.XXX.XXX.XXX. The valid range is between 255.000.000.000 and 255.255.255.255.

Your setting is:

IGATEADDRESS — Adds a network number, the net mask of the network number, and the Internet address of the gateway to the gateway address table. There are no default settings. Available parameters include:

1. Add flag — add, 1, del, 0.
2. Network number — 1 to 15 characters in format XXX, XXX.XXX, or XXX.XXX.XXX, where X is 0-9, and XXX is not greater than 255.
3. Internet address — 7 to 15 characters in format XXX.XXX.XXX.XXX, where X is 0-9, and XXX is not greater than 255.
4. Net mask — 15 characters in the format XXX.XXX.XXX.XXX. The valid range is between 255.000.000.000 and 255.255.255.255.

Your setting is:

IBROADCAST — Sets up Internet broadcast address. The default setting is 1. Available parameters include:

1. Add flag — add, 1, del, 0.
2. Broadcast mode — 0, 1.

Your setting is:

Internet and Broadcast Addresses

There are three classes of Internet addresses. Figure 4-2 describes the differences between classes A, B, and C and gives an example of a subnet and netmask.

Figure 4-3 describes the broadcast addresses.

MOST SIGNIFICANT BITS	IP ADDRESS CLASS	BYTES	EXAMPLE	HEX
0	A	N.H.H.H	6.1.128.157	0601809D
10	B	N.N.H.H	128.1.128.157	8001809D
110	C	N.N.N.H	192.0.1.157	C000019D

NETMASK EXAMPLE

CLASS A INTERNET ADDRESS

06.01.128.157

NET SUBNET HOST

NETMASK = Mask of SUBNET + NET

NETMASK = 255.0.0.0

6642-7A

Figure 4-2. Internet Addresses.

BERKLEY 4.2	4.3 AND INTERNET
NET.0.0.0	NET.255.255.255 SEND TO ALL SUBNETS
	255.255.255.255 THIS SUBNET ONLY

6642-8

Figure 4-3. Broadcast Addresses.

NETWORK OPERATOR INFORMATION

This discussion describes the procedures you should follow and the information you will need to join an existing local area network (LAN).

CAUTION

If you enter the examples used in this section, or any other invalid Internet address information, you could seriously impair the operation of your network. Be sure to check with your network administrator before entering any address information.

Included in this discussion of the LAN operator information are the following topics:

- LAN Worksheet
- Description of a LAN
- How to enter the terminal and host Internet addresses
- How to add an entry to the local address table
- How to add an entry to the gateway table
- How to add an Internet broadcast address
- How to use the Telnet protocol

LAN Worksheet Information

You will find a worksheet at the end of this section. This worksheet is a suggested method for gathering the information required by both you and the network administrator to access a network. The worksheet supplies introductory LAN information for the network administrator. There are several fields to be completed by you, including terminal type, terminal Ethernet address, and host names. The remaining fields should be filled in by your network administrator. When the worksheet is complete, the information can be used in entering LAN address requirements.

Each field title on the worksheet is followed by the command required for entry of information for that field. For example, the columns labeled HOST NAME and INTERNET ADDRESS are followed on the next line by (IHOSTADDRESS). You can find the procedure for entering the host Internet address by referring to "Using IHOSTADDRESS to Enter the Host Internet Address" later in this section.

What Is a LAN?

A *local area network* (LAN) is system of interconnected terminals and computers that allows a user to access several host computers without the need to connect and disconnect physical connectors.

The LAN interface can be accessed through the LAN connector on the back panel of the Graphics module.

Each host on the LAN has two unique addresses: an *Internet address* and an *Ethernet address*. The network software uses a host's Internet address when generating messages to send to another host. Before these messages are sent out over the network, the Internet addresses are converted to Ethernet addresses, which the network hardware uses to communicate with the network. Ethernet addresses for the 4211 are assigned at the factory by Tektronix, and cannot be changed.

To set up communications on your LAN, check with your network administrator for the addresses you will need to enter. You can use the LAN Worksheet supplied at the back of this section to gather information. Then use only those of the following procedures that you need in order to set up and use your LAN. You will only need to enter these addresses once, during your initial installation.

When you are finished entering addresses and adding entries to tables, you should save those entries with the SAVEADDRESSES Setup command. The addresses are then loaded back into the system when the 4211 is turned on, or reset.

If you have used the FACTORY command, use the LOADADDRESSES command to reload the addresses.

Using ITERMADDRESS to Determine the 4211 Ethernet Address

The 4211 Ethernet address is supplied at the factory. To view the 4211 Ethernet address, use the following procedure:

1. Put the 4211 in Setup and enter the STATUS command followed by ITERMADDRESS.

```
STATUS ITERMADDRESS
```

2. The 4211 will display the Internet address, the Ethernet address, and the net mask as in Example 4-1.

In this example, the terminal Internet address has not been entered, the first four digits in the example are zeros. The 08:00:11:00:E0:57 is the 4211 Ethernet address. The 0 following the Ethernet address will be replaced with the net mask, and the final 0 will be replaced with the broadcast mode.

Using ITERMADDRESS to Enter the Terminal Internet Address

To enter the terminal Internet address use the following procedure:

1. Check with the network administrator to determine your terminal Internet address. If for any reason you need to change the Internet address with ITERMADDRESS, the system will also delete the entries on the gateway and local address tables.

Example 4-1. Terminal Ethernet Address.

```
STATUS ITERMADDRESS /0.0.0.0/08:00:11:00:E0:57/0/0
```

Example 4-2. LAN Address Entry.

```
ITERMADDRESS add WHITMAN,129.23.6.45,4294901760
IHOSTADDRESS add RUBY,112.10.4.12
ILANADDRESS add 193.25.33.35,08:66:74:88:cd:ab
IGATEADDRESS add 7,06.00.12.13,255.143.235.251
IBROADCAST add 1
```

2. Put the 4211 in Setup and enter the ITERMADDRESS command, the add flag, your terminal name, the network address, and the net mask, as in Example 4-2.

In this example, the add flag is *add* (to delete, set the add flag to *del*). WHITMAN is your terminal name, known only on your own network. 129.23.6.45 is the network address, and 4294901760 (FFFF0000 hex) is the net mask.

3. The Internet address of the terminal is automatically saved in nonvolatile memory.

Using IHOSTADDRESS to Enter the Host Internet Address

To enter the host Internet address and add it to the host table, use the following procedure:

1. Check with the network administrator to determine your host(s) and corresponding Internet address(es). Maximum number of host entries is 30.
2. Put the 4211 in Setup and enter the IHOSTADDRESS command, the add flag, the name of the host computer you will access, and the Internet address of the host, as in Example 4-2.

In this example, the add flag is *add* (to delete, set the add flag to *del*). RUBY is the name of the host computer. 112.10.4.12 is the host Internet address. This information will be added to the host table.

3. If this is the last LAN setup entry you need to make, enter SAVEADDRESSES to save the information. Otherwise continue entry procedures.

Using ILANADDRESS to Add an Entry to the Local Address Table

If a host that you want to communicate with does not use the ARP (Address Resolution Protocol), then you must enter the conversion of the Internet address to Ethernet address in the ARP table. Use the following procedure:

1. Check with your network administrator to determine both the host Internet address and the host Ethernet address (maximum number of host entries is 30).
2. Put the 4211 in Setup and enter the ILANADDRESS, the add flag, the host Internet address, and the host Ethernet address, as in Example 4-2.

In this example, the add flag is *add* (to delete, set the add flag to *del*). The host Internet address is 193.25.33.35 and the Ethernet address is 08:66:74:88:cd:ab.

3. If this is the last LAN setup entry you need to make, enter SAVEADDRESSES to save the information. Otherwise continue entry procedures.

Using IGATEADDRESS to Add an Entry to the Gateway Table

If the host you will be accessing is not on your local network, your network administrator will ask you to add an entry to the Internet Routing Table. This entry is the gateway to the network of the host you wish to access. Use the following procedure:

1. Check with the network administrator to determine the gateway table entry.
2. Put the 4211 in Setup and enter the IGATEADDRESS command, the add flag, the remote network number, the Internet address of the host, and the net mask, as in Example 4-2.

In this example, the add flag is *add* (to delete, set the add flag to *del*). The network number is 7, the Internet address is 06.00.12.13., and the net mask of the network number is 255.143.235.251.

3. If this is the last LAN setup entry you need to make, enter SAVEADDRESSES to save the information. Otherwise continue entry procedures.

Using IBROADCAST to Enter an Internet Broadcast Mode

If you need to set the Internet broadcast address, your network administrator will let you know. Then you can use the following procedure:

1. Check with the network administrator to determine the broadcast mode.
2. Put the 4211 in Setup and enter the IBROADCAST command and the add flag, followed by a 0 (zero) or a 1 (one) as in Example 4-2.

In this example the add flag is *add* (to delete, set the add flag to *del*). You have set the address to 255.255.255.255 by setting the mode to 1.

3. If this is the last LAN setup entry you need to make, enter SAVEADDRESSES to save the information. Otherwise continue entry procedures.

Using the Telnet Protocol

To set the H0: port of your 4211 to a local Telnet connection, put the 4211 in Setup and then enter the following commands:

```
HOSTPORT HO:
DMAP HO: ,NTN
```

The prompt *telnet* appears on your screen. Your 4211 is now ready to respond to Telnet commands. (Some hosts negotiate the Telnet options, but don't perform the desired action.) See "Working With the Telnet Interface" in Section 8 for information on the commands you can use in Telnet.

SETTING COAX COMMUNICATIONS PARAMETERS

The following pages describe the procedures for setting the communications parameters for the Coax option.

NOTE

All information, instructions, and responses with shaded gray background (as shown here) refer only to the 4211 with the Coax option.

If you need instructions for entering Setup commands, refer to "Using Setup" in Section 3.

To configure your 4211 for Tektronix graphics on an IBM host system, you need to define only two communications settings, set by the TEKHEADER and TMETHOD commands. The appropriate settings made by these commands depend entirely on your host's operating characteristics.

Here's what you need to do to configure your 4211 for HOSTPORT COAX communications:

- Your 4211 needs to interpret an incoming header character so that it will recognize non-IBM commands. The header character is defined by an integer value. Get this integer value from your systems programmer (the factory default value is 112). Refer to the *4210 Series Command Summary* for more information regarding the TEKHEADER command.
- Find out from the systems programmer which character translation method (either ASCII-to-EBCDIC translation table or ASCII plus-constant) is being used by host applications. Refer to the *Programmers Manual* for more information regarding EBCDIC and ASCII translation tables and the ASCII data transmission algorithm. (ASCII plus constant is by far the most common.)

In addition, you should make sure that the 4211's queue size setting is compatible with your IBM host. The QUEUESIZE command is described earlier in this section.

Once you've assembled the required information from the host computer center, you're ready to perform the following steps:

1. Put the 4211 in Setup, if it isn't already.
2. Enter the TEKHEADER command, using the integer value supplied by your computer center. For example, if the value were 112, you would enter:

```
TEKHEADER 112
```

3. Enter either of the following commands according to the information supplied by your computer center personnel:

- If the host computer uses the ASCII-to-EBCDIC translation-table method to convert ASCII data to EBCDIC characters, enter the following command:

```
TMETHOD 0
```

- If the host computer uses the ASCII plus-constant method to convert ASCII data to EBCDIC character, enter the following command:

```
TMETHOD 1
```

4. Store your new configuration in nonvolatile memory by entering:

```
NVSAVE
```

5. Press the Setup key to take the 4211 out of Setup.

All other communications settings for HOSTPORT COAX are predefined by the factory for correct operation with an IBM 3274 or 3276 Control Unit.

CONFIGURING THE 4211 FOR DFT MODE

Your 4211 can communicate with an IBM control unit in one of two *attachment modes*:

- *Control Unit Terminal mode (CUT for short)*. In CUT mode, the control unit handles host commands and works with the 4211 to handle user keystrokes. CUT mode is the factory default.
- *Distributed Function Terminal mode (DFT for short)*. In DFT mode, the 4211 (rather than the control unit) is responsible for carrying out host commands and handling user keystrokes.

Follow this procedure if you will be using DFT mode to communicate with the IBM control unit. One particular advantage of DFT mode is that it allows you to use *multiple sessions* — a *session* is an independent connection between the 4211 and a host.

While this procedure shows you how to access the Coax Configuration Summary menu and select DFT settings, you must consult your systems programmer for the appropriate settings for your 4211. The settings that you will need to select are listed in Table 4-3; the last column of the table is empty so that you can list the appropriate settings for your 4211, as provided by your systems programmer.

Table 4-3
SELECTING DFT SETTINGS

DFT Feature		Default Setting	Alternate Setting	Alternate Setting	Alternate Setting	Your DFT Setting (fill in)
Number of Host Sessions?		1	1—5	1—5	1—5	
Key Click at Power-Up?		Yes	No/Yes	No/Yes	No/Yes	
Invalid Ctrl Codes Returned as Op-Check?		Yes	No/Yes	No/Yes	No/Yes	
Clear Key Resets Screen Size?		Yes	No/Yes	No/Yes	No/Yes	
Mouse or Thumbwheels Connected?		No	Yes/No	Yes/No	Yes/No	
Alternate Screen Size for Each Host Session?	Session A	32x80	24x80	43x80	27x132	
	Session B	32x80	24x80	43x80	27x132	
	Session C	32x80	24x80	43x80	27x132	
	Session D	32x80	24x80	43x80	27x132	
	Session E	32x80	24x80	43x80	27x132	

After you have obtained the appropriate settings, you are ready to begin this procedure.

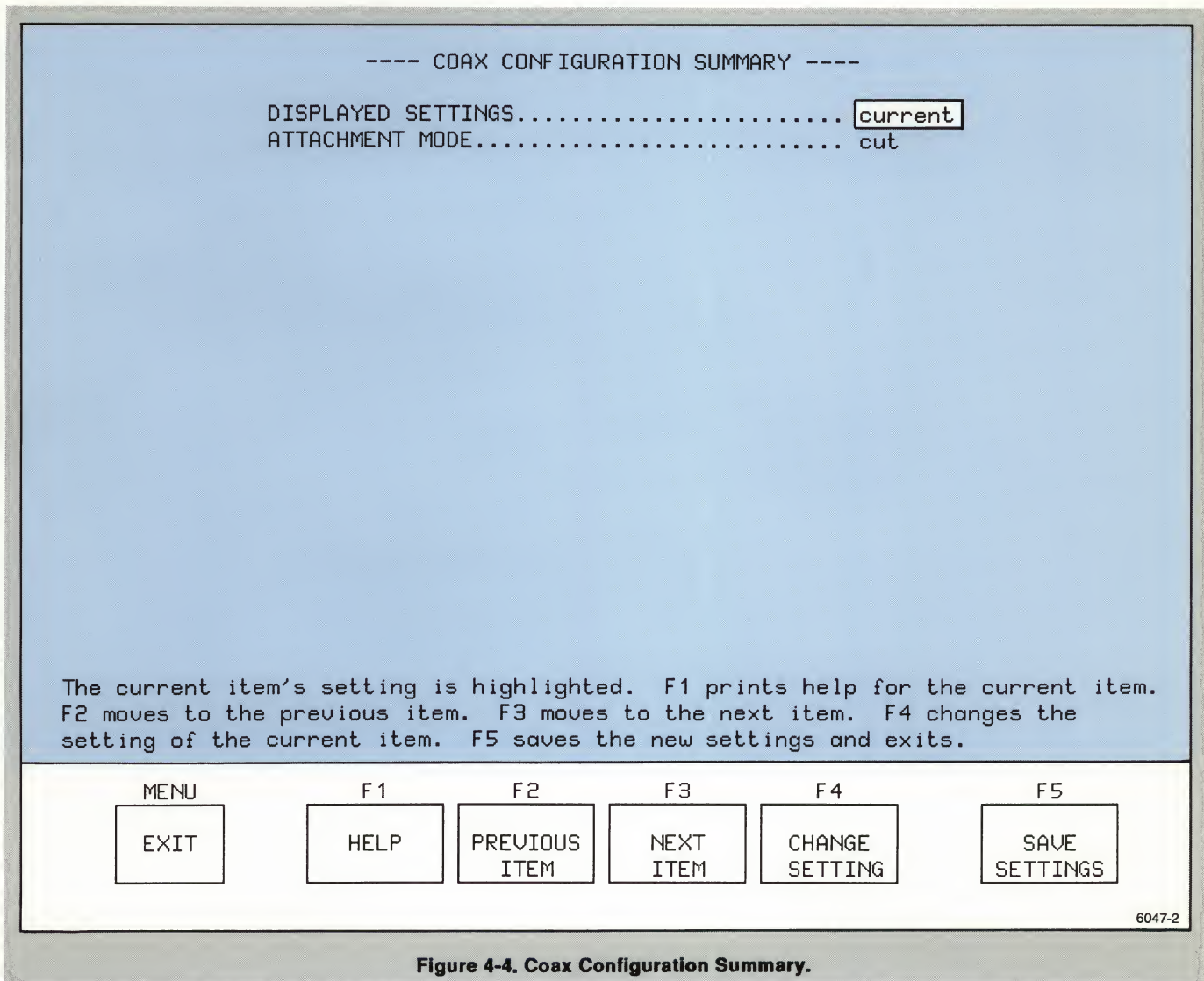
Start by accessing the Coax Configuration Summary menu:

1. Press the Menu key.
2. Press the F3 key. Notice the banner that appears at the bottom of the screen.
3. Press the Space Bar.

The menu is displayed on the screen. Figure 4-4 shows how the menu should look.

The first line of the menu is a status line that shows you what the current settings are before beginning the configuration process. Notice that the word *current* is highlighted; when you change any settings, this setting will automatically change to *altered* to show that you have made a change.

The help message near the bottom banner shows which keys to use to cycle through the summary, select settings, and save those settings in nonvolatile memory.



Now, continue this procedure by selecting DFT mode:

4. Press F3 to go to the next line.
5. Press F4 to change the attachment mode to DFT (notice that the setting in the first status line has changed to *altered*).

The menu for DFT mode now appears on the screen. The display should appear similar to Figure 4-5.

Continue by selecting settings for DFT mode:

6. Using the appropriate function keys, cycle through the menu and select the DFT settings that have been provided by your systems programmer.

If you select multiple sessions (you can select up to five), each session is listed at the bottom of the summary and is denoted by the letters *A* through *E* — cycle through each session and select the appropriate alternate screen size for each one.

NOTE

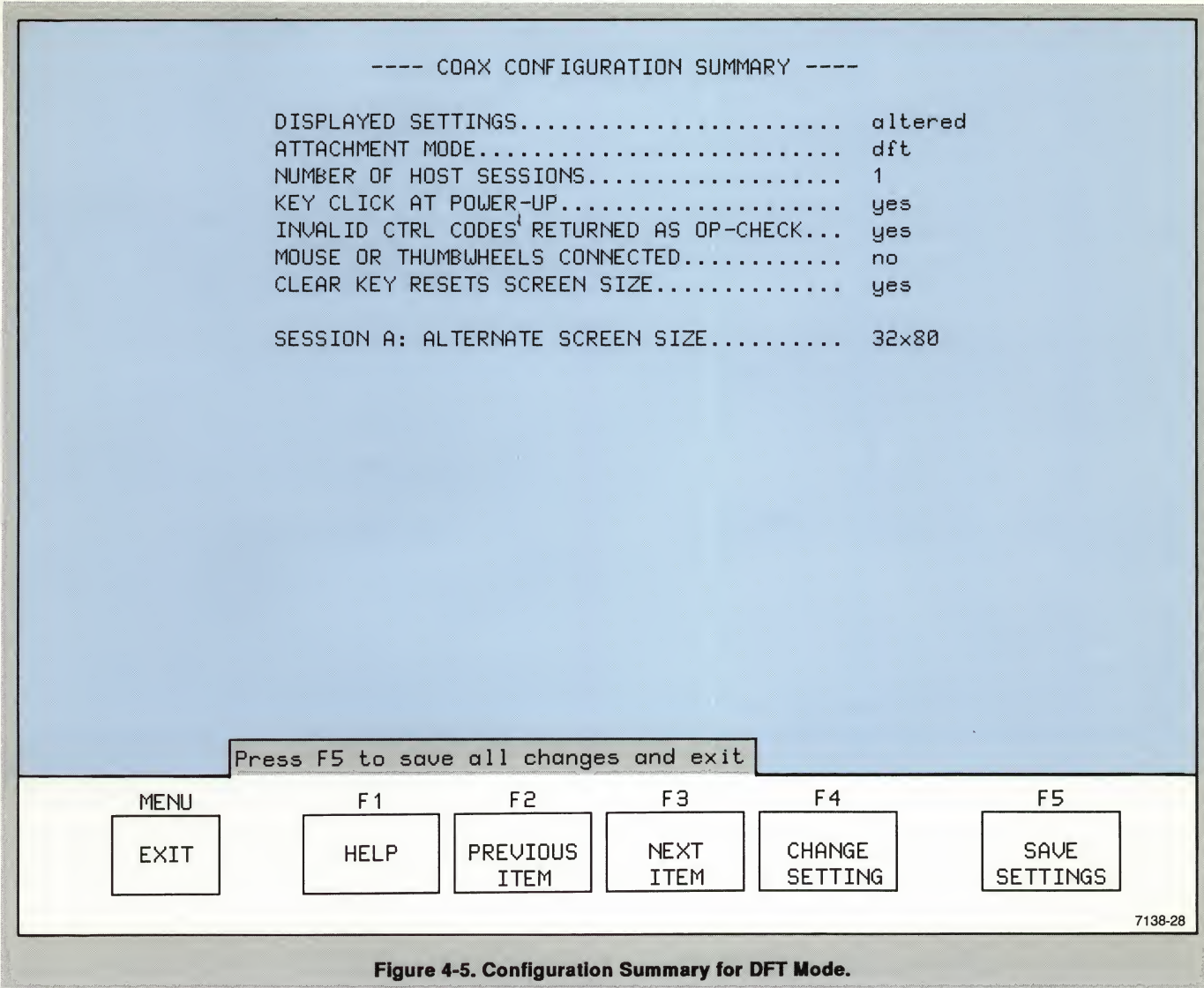
Each DFT session reserves memory that could otherwise be used for 4211 features such as background copying or segment definitions. Therefore, it is best to select only the number of sessions that you would typically use — this will lessen the likelihood that any of the 4211's features are affected by a lack of memory.

7. Press F5 to save the settings (if you want to exit without saving the new settings, press the Menu key instead).
8. Press F1 to restart the 4211 with the new settings (if you want to continue with the old settings, press the Menu key; the new settings are still saved in nonvolatile memory and will take effect the next time the 4211 is reset or powered down and then back up).

Once you have saved the settings, those settings are listed as *current* on the Coax Configuration Summary menu.

NOTE

Once the 4211 is configured for DFT mode, the 4211 powers up in SESSION A. Section 8 shows you how to use the Jump key to select other sessions.



TESTING COMMUNICATIONS

After you have set the communications parameters, you are ready to select a host command mode and log in to your host computer. The instructions for selecting a host command mode are described in the next discussion. The procedure for logging in and running programs depends on your particular computer. If you're not familiar with the procedure for your computer, consult your computer center staff for which mode to select for your application and how to log in to your host computer.

After you've selected a mode and logged in, enter some commands to the computer to verify the communications settings. Use commands that require a response from the host computer. For example: type a directory listing, create a file, and edit a file.

SELECTING A HOST COMMAND MODE

You can select a host command mode that tells the 4211 what syntax to expect in commands from the host. The choices are:

Tek	For programs that use Tek syntax, typically graphics imaging applications.
ANSI	For programs using ANSI Standard X3.64 syntax, typically text editors.
VT52	For programs using VT52 style commands.
ANSI VT200	For application programs using ANSI Standard X3.64 and intended for VT200 terminals.
ANSI VT100	For applications programs using ANSI Standard X3.64 and intended for VT100 terminals.
ANSI MULTINATIONAL	For programs using ANSI Standard X3.64 that expect the ASCII Multinational Character Set.

Follow these steps to select the proper mode:

1. Check with your computer center staff or your systems programmer to determine which host command mode you should use to communicate with your host application.
2. Put the 4211 in Setup (press the Setup key) and select the mode with the CODE command as in the following examples:

- To select Tek mode, enter:

CODE TEK

- To select ANSI mode, enter:

CODE ANSI

- To select ANSI mode with a VT200 initialization, enter:

CODE ANSI VT200

- To select ANSI mode with a VT100 initialization, enter:

CODE ANSI VT100

- To select VT52, enter:

CODE VT52

3. Remove the 4211 from Setup (press the Setup key).

When you request STATUS CODE, the 4211 will respond simply with CODE ANSI for each of the ANSI initializations.

LAN WORKSHEET

DEVICE DESCRIPTION

This Tektronix graphics terminal implements the DARPA standard protocols Telnet, TCP, IP, ARP and the Ethernet Link level protocol. The Ethernet address of the terminal is set at the factory and cannot be changed by the user. The IP address should be assigned by the network administrator. The Terminal TCP/IP implementation uses a static host

table for the name to internet address translation. These may be entered and saved to disk by the user. For hosts that do not support ARP, the terminal supports user entry of internet address to Ethernet address translation entries. For use over several networks, the terminal also supports gateway entries including a default gateway.

SECTION 1 — to be filled in by the user

1. Terminal type: _____
2. Terminal Ethernet address: _____ (hex format)
(Status ITERMADDRESS)
3. Hosts I need to communicate with: _____

SECTION 2 — to be filled in by the network administrator

1. Terminal name: _____
2. Network number: _____ Subnet number: _____
Network and subnet mask: _____
3. Terminal's internet address: _____ (decimal format)
(ITERMADDRESS)
4. Network broadcast mode: 255.255.255.255 or 0.0.0.0 (circle one)
(IBROADCAST)

5. Host address(es):

Host name (IHOSTADDRESS)	Internet address(es) (decimal) (IHOSTADDRESS)(ILANADDRESS)	LAN address if no ARP (hex) (ILANADDRESS)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

6. Gateways to remote networks:

Gateway address (IGATEADDRESS)	Remote net number (IGATEADDRESS)	Net mask of remote net number (IGATEADDRESS)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

USING PRINTERS, PLOTTERS, AND THE RASTERIZER

The 4211 can be connected to a variety of copiers, printers and plotters to provide hardcopies of both graphics and text.

Color Copiers and Printers. You can make color dialog and screen copies on the following color copiers and printers:

- TEKTRONIX 4692 Color Graphics Copier
- TEKTRONIX 4693D Color Image Printer
- TEKTRONIX 4696 Color Graphics Copier
- TEKTRONIX ColorQuick Printer
- Alps ALQ324e Printer
- Epson LQ-2500 Printer

NOTE

*This section does not apply to the 4696RGB Copier. Refer to the **4696RGB User Manual** for special copying information.*

Monochrome Printers. You can make black-and-white dialog and screen copies on these monochrome graphics printers:

- TEKTRONIX 4644 Printer
- DEC LN03 Laser Printer
- DEC LA210 Letterprinter
- Hewlett-Packard DeskJet
- Hewlett-Packard LaserJet+
- Hewlett-Packard LaserJet Series II
- Hewlett-Packard ThinkJet
- Other Centronics-style printers that use Epson FX-80 graphics protocol

You can also make dialog-only copies on most Centronics-style printers that don't have graphics capability (that is, without Epson FX-80 graphics protocol).

Plotters. The following plotters can be used with the 4211 to produce large detailed line drawings:

- TEKTRONIX 4662 Interactive Digital Plotter
- TEKTRONIX 4663 Interactive Digital Plotter
- Hewlett-Packard 7475A Plotter
- Hewlett-Packard 7550A Plotter
- Most plotters that are compatible with the Hewlett-Packard Graphics Language (HPGL) command set

Rasterizer. The 4211 is compatible with the TEKTRONIX 4510A Color Graphics Rasterizer.

This section provides information on using the copiers, printers, plotters and rasterizer listed here. To find related information look under the following headings in this section:

- For general information on making copies, begin with "Making Copies."
- If you want to customize your copy — to change the image size, for example, see "Customizing Your Copies."
- For information that applies specifically to the 4693D, see "Using the 4693D Color Image Printer."
- For information that applies specifically to the 4692, see "Using the 4692 Color Graphics Copier."
- To adjust copy features on the 4510A Rasterizer, see "Using the 4510A Rasterizer."
- If you are using a plotter and want to assign color indices to particular pens, for example, refer to "Using a 4662 or 4663 Plotter" or to "Using an HPGL-Compatible Plotter."

MAKING COPIES

The following procedures show how to make both color and monochrome hardcopies of the display. (If you are using a host program that selects copier attributes or initiates copies for you, follow the host program's procedures instead.)

A copy of text from the dialog buffer is called a *dialog copy*; a copy of everything that is currently displayed on the screen — be it graphics, a screen of dialog text, or both — is called a *screen copy*.

INITIATING A COPY OPERATION

To make a copy, first display on the screen what you want to copy. Then follow the instructions for copying either text or graphics.

Copying Graphics

When the Tek light is on, you can copy the entire screen — both the graphics and the dialog — or just the graphics:

- To copy the entire screen press the SCopy key.
- To copy just the graphics:
 1. If the dialog area is visible, press the Dialog key to make the dialog area invisible. (The Dialog key acts as a toggle — pressing it again will redisplay the dialog area.)
 2. Press the SCopy key.

Copying Text

If the Tek light is on, you can copy what's displayed on the screen or one or more standard-size pages of text.

- To copy just what appears on the screen, press the SCopy key.
- To copy a page of dialog text (that is, up to 60 lines of text beginning at the top of the screen and extending down to include text off the screen), press the DCopy (Shift-SCopy) key. This assumes that the HCDAATTRIBUTES and HCFEATURES commands are set to their defaults.

In RS-232-C and LAN communications, the default length is 60 lines of text, beginning at the top of the screen, extending down into the buffer and including text off the screen. In coax communication, a page is limited to 32 lines and includes only the text on the screen.

- To copy multiple pages from the dialog buffer:
 1. Issue the HCDAATTRIBUTES command, which controls how much of the dialog buffer is copied and how the pages break (see the discussion "HCDAATTRIBUTES — Copying Multiple Pages From the Dialog Buffer" later in this section).
 2. Press the DCopy (Shift-SCopy) key.

The background color of your display may copy as white (no color), depending on the type of copier and its settings. Refer to "Determining Background Color," next, for more information.

When the Tek light is off (VT200 keyboard functionality) and you are using a VT200 application, you can copy just the text that appears on the screen or the whole dialog area:

- Pressing the Print key results in either a copy of the screen or a copy of the whole dialog area, depending on the host application.
- Text copies will always print in black and white.

CONTROLLING LINE FEEDS

Printers differ on the line-endings that they expect — either a Carriage Return (C_R) or a Carriage-Return/ Line-Feed Combination ($C_R\text{-}F$). Since the 4211, as delivered from the factory, is set to send a Carriage-Return/Line-Feed combination, it will generate extra blank lines in hardcopies made on printers that expect just Carriage Returns. The HCMONochrome command is designed to control the line endings sent to certain monochrome printers that may have this difficulty.

If your printer is one of those affected by HCMONochrome (Epson FX-80 compatible, TEKTRONIX 4644, DEC LA210, or Hewlett-Packard DeskJet or ThinkJet), issue the following command to correct this problem:

```
HCMONochrome 0
```

To change this setting back to the default, issue the following:

```
HCMONochrome 1
```

Depending on your printer model, an alternative may be to change settings on the printer to alter the line endings that it expects — see the User manual provided with the printer for details.

DETERMINING BACKGROUND COLOR

Many applications use black as a background color on the display, but typically, people don't want the background on a hardcopy to be black. For this reason the 4211 reverses black and white when you request a hardcopy.

You can, however, control the background color of the hardcopy using the copy keys.

If you do want the black on the screen to print on the hardcopy, you can stop black and white from reversing — just hold down the Ctrl key while you press the SCopy key. This will make the hardcopy appear exactly as it does on the screen. Keep in mind that pressing *Ctrl-SCopy* overrides black and white reversal only on screen copies, not on dialog copies.

If you are using a 4693D, you can control how black-white reversal occurs using HCFEATURES 12. Refer to "Using the 4693D Color Image Printer," later in this section, for more information.

MAKING MULTIPLE COPIES

There are two easy methods to make multiple copies.

- Just press the SCopy or DCopy key once for each copy needed. For instance, to make four copies of the entire screen display, press the SCopy key four times.
- You can also increase the number of copies printed each time you press the SCopy or DCopy key. For example, if you want three copies every time you press SCopy or DCopy, enter in Setup:

```
HCCOPIES 3
```

STOPPING A COPY OPERATION

To stop a copy operation in process, press the Cancel key, located in the top row of keys on the keyboard.

You can also stop a copy operation by pressing the RESET button, but this will erase all the graphics and text from memory and the screen.

Stopping a copy operation by either method will also cancel any copy requests that are queued for background copying.

NOTE

Some copiers will continue to print for a few seconds until their buffers are empty; this is more likely to occur with a dialog copy than with a screen copy.

MAKING BACKGROUND COPIES

By default, the 4211 processes copy requests in the *foreground*; that is, the 4211 cannot be used for anything else until the copy is finished. However, you can use the HCBACKGROUND command to change the factory default settings to allow screen copying in the *background*, which frees the 4211 and allows you to use it while the copying is done. Keep in mind that you can use background copying only for screen copies; dialog copies always print in the foreground.

When you press the SCopy key, the 4211 takes up to 20 seconds to spool the screen display (that is, to process it for the printer) and then become available again for input.

NOTE

The printer must be connected to the COPIER port (rather than PORT 0 or PORT 1) to use the HCBACKGROUND command.

*With the 4693D or the LaserJet+, the HCBACKGROUND command has **no** effect. These two printers process images at a high enough speed that they do not support background copying.*

The HCBACKGROUND command turns background copying on or off and allocates the memory that background copying requires. When using this command, you must specify the *complexity* of the image as well as the number of *different* images you wish to spool.

To specify an image's complexity, you must choose between three keywords — SIMPLE, AVERAGE, or COMPLEX — SIMPLE allocates 75Kb, AVERAGE allocates 150Kb, and COMPLEX allocates 300Kb of memory. For most business graphics, such as graphs and charts, you should probably choose AVERAGE. For more detailed engineering schematics, you will probably need to choose COMPLEX. If you don't allocate enough memory for background copying, the 4211 will issue an error message when you press the SCopy key. If this happens, simply go back into Setup and reenter HCBACKGROUND to allocate more memory.

As an example, to spool one *average* graphics image for background copying, follow this procedure:

1. Put the 4211 in Setup.
2. Enter the following command:

```
HCBACKGROUND  AVERAGE, 1
```

This command allocates enough memory for one average image. If you want more than one copy of the image, you don't need to allocate any more memory — just follow the procedures under "Making Multiple Copies," which is discussed earlier in this section.

3. Display on the screen the first image you want to copy. If dialog text appears on the screen and you don't want it in the hardcopy, press the Dialog key to toggle it off the screen.
4. Press the SCopy key. The 4211 takes less than 20 seconds to spool the image.

NOTE

If you have not allocated enough memory for an image, the 4211 will issue an error message; however, if you toggled the dialog area off the screen you won't be able to see the message. You can check for a memory error by pressing the Dialog key to redisplay the dialog area.

If there is a memory error, enter Setup and allocate more memory. For example, if you specified AVERAGE 1, this time specify COMPLEX 1. (You can also allocate more memory by specifying multiple images — that is, AVERAGE 2 reserves twice as much memory as AVERAGE 1.)

To spool two or more different images, simply allocate more memory for background copying. For example, to spool two *simple* images, follow this procedure:

1. Put the 4211 in Setup, if it's not already.
2. Enter the following command:

```
HCBACKGROUND  SIMPLE, 2
```

3. Display on the screen the image that you want copied. If dialog text appears on the screen and you don't want it in the hardcopy, press the Dialog key to toggle it off the screen.
4. Press the SCopy key.
5. When the image begins to copy and the 4211 is free, display the next image on the screen.
6. Press the SCopy key again.

NOTE

If you run out of memory while spooling multiple images, only the image that caused the memory error is affected. That is, once an image has successfully spooled it is not affected by any subsequent memory errors.

If you do run out of memory, you will have to respool the image after either (1) allocating more memory for background copying or (2) waiting for the 4211 to free some memory by finishing a copy.

More likely, you will want to determine how much memory you typically require for copying and then save those settings in nonvolatile memory. You can override those settings later if you receive an error message caused by an image that is more complex than usual.

To save the settings for background copying in nonvolatile memory, enter the following command:

```
NVSAVE
```

To turn off background copying, enter:

```
HCBACKGROUND NONE
```

To make multiple copies of an image in the background, refer back to "Making Multiple Copies."

CREATING A DIALOG HARDCOPY LOG

On continuous-feed copiers (that is, on the TEKTRONIX 4644, 4696, and ColorQuick; Alps ALQ324e; DEC LA210; Hewlett-Packard DeskJet; and Epson FX-80 and LQ-2500), you can create a hardcopy log of all text in the dialog area — this is known as *data logging*. The AUTOPRINT command simultaneously copies text in the dialog area and to a printer as it's being displayed on the screen.

NOTE

Data logging is not supported on page-feed copiers — that is, on the Hewlett-Packard LaserJet+ and LaserJet Series II; DEC LN03; and TEKTRONIX 4692 and 4693D.

To turn on data logging, follow these steps:

1. Be sure the printer or copier is connected to the COPIER port and turned on. (Section 2 tells how to install the printer or copier.)
2. Activate data logging by entering in Setup:

```
AUTOPRINT YES
```
3. Now when you use the dialog area, all text will be logged. You can exit Setup and communicate with the host — this text will also be logged.
4. To turn data logging off, be sure the 4211 is in Setup and enter:

```
AUTOPRINT NO
```

When the Tek key light is off, you can toggle data logging without entering Setup by pressing DCopy and Ctrl-DCopy. See the "Data Logging Macro" in the macro examples later in Section 7.

COPYING DIRECTLY TO THE PRINTER

On continuous-feed copiers (listed above in "Creating a Dialog Hardcopy Log"), you can invoke Controller mode to send data directly to the copier (or printer) without displaying it on the screen using the following procedure:

NOTE

*Controller mode is **not** supported on page-feed copiers — that is, on the Hewlett-Packard LaserJet+ and LaserJet Series II; DEC LN03; and TEKTRONIX 4692 and 4693D.*

1. Be sure the printer or copier is connected to the COPIER port and both are turned on (refer to Section 2).
2. Enter the following command in Setup:

CONTROLLERMODE YES
3. Now all text that is typed from the keyboard or sent from the host is sent to the printer, but the 4211 does not display it on the screen. If the 4211 is in Local mode, only text typed at the keyboard is sent to the printer.
4. To stop printing text that is typed at the keyboard and display it on the screen, enter the following command in Setup:

CONTROLLERMODE NO

If both CONTROLLERMODE and AUTOPRINT are set to YES, CONTROLLERMODE supersedes AUTOPRINT.

If CONTROLLERMODE is set to NO and AUTOPRINT is YES, AUTOPRINT remains active.

CUSTOMIZING YOUR COPIES

You can use the 4211's factory default settings to make copies, or you can change the settings to fit your copy needs. The next few pages describe the commands you can use. Table 5-1 shows which commands apply to which copiers. Be sure to enter Setup before issuing these commands.

SAVING OR SWITCHING YOUR SETTINGS

You can save the settings made with these commands by issuing the NVSAVE command (see "Saving Command Settings" in Section 3), or you can reissue them whenever you make a copy. If you need to switch frequently from one set of copy attributes to another, you can program keys to select the different settings you need (see "How to Program Tek Keys" in Section 7 for information on programming keys).

Table 5-1
COMMANDS FOR CUSTOMIZING COPIES

Command	Copiers Affected									
	Color Graphics Copiers					Monochrome Graphics Copiers				Text-Only (Centronix- -Style) Printers
	TEKTRONIX				Epson LQ-2500, Alps 324e	Hewlett-Packard		DEC LA210, LN03	Epson FX-80, TEKTRONIX 4644	
	4692	4696	4693D	Color-Quick		DeskJet, ThinkJet	LaserJet			
HCCHARSETS		√		√	√	√	√	√	√	√
HCDATTRIBUTES ^a	√	√	√	√	√	√	√	√	√	√
HCDATARES	√									
HCDENSITY	√									
HCDITHER	√	√	√	√	√	√	√	√	√	
HCFEATURES ^b	√	√	√	√	√	√	√	√	√	√
HCFORMWIDTH		√							√	
HCMAP	√	√	√	√	√	√	√	√	√	
HCMONOCHROME					√	√		√	√	√
HCORIENT	√	√	√	√	√	√	√	√	√	
HCREPAINT	√									
HCSIZE ^a	√	√	√	√	√	√		√	√	

^a Dialog copies only

^b Not all of the HCFEATURES command parameters apply to all devices. See Table 5-2 in the discussion "Paging for Continuous-Feed Copiers" for a further explanation of this command.

WHEN TO ISSUE COPY-CUSTOMIZING COMMANDS

It's best to issue copy-customizing commands *before* you display the text or graphics you want to copy, since the Setup commands are written to a portion of the screen, typically the dialog area. If you are copying graphics from most applications, this is not a problem — you can use the Dialog key to toggle the dialog area off the screen.

For instance, to customize a screen copy after the graphics are displayed, follow this procedure:

1. Enter Setup and issue the commands to customize the copy.
2. Press the Dialog key to toggle the dialog area off the screen.
3. Press the SCopy key.

Special Considerations for Dialog Copies

Since Setup commands are typically written to the dialog area, if the text that you want to copy is already on the screen you will have to disable the dialog area before customizing the hardcopy. This will cause the commands to write in the graphics area and keep the text uncluttered.

- To avoid cluttering the dialog area, disable it before entering the commands:

DAENABLE NO

Special Considerations for 4010-Style Graphics Applications

If you want to customize a copy of a 4010-style graphics application after the image is displayed, you might have to enable the dialog area before customizing the hardcopy. (4010 applications typically don't use the dialog area, and the commands would write over your graphics.)

- To avoid cluttering the graphics area of a 4010-style application, enable the dialog area before entering the commands:

DAENABLE YES

NOTE

Since the DAENABLE command is displayed before it is executed, it will appear in the area that you are trying to keep free of text. If this is not suitable to your particular situation, you can avoid this by creating a key macro to execute the command for you. (See "Dialog Area Disabling and Enabling Macros" later in Section 7 for procedures to create the necessary macros.)

SELECTING IMAGE ORIENTATION

When you are working with any of the copiers in the following list, use the HCORIENT command to select image orientation. You can position the graphics image on the paper or transparency in one of four positions, as illustrated in Figure 5-1.

- TEKTRONIX 4692 Color Graphics Copier
- TEKTRONIX 4693D Color Image Printer
- TEKTRONIX 4696 Color Graphics Copier
- TEKTRONIX ColorQuick Printer
- Alps ALQ324e Printer
- DEC LA210 Letterprinter
- DEC LN03 Laser Printer
- Epson LQ-2500 Printer
- Hewlett-Packard DeskJet
- Hewlett-Packard LaserJet+
- Hewlett-Packard LaserJet Series II
- Hewlett-Packard ThinkJet

If you are using an Epson FX-80 or a TEKTRONIX 4644, the only valid image orientation is horizontal.

If you are working with a 4693D, it tailors the image to the best possible fit for the orientation you choose. Refer to "Using the 4693D Color Image Printer," later in this section, for more information.

- To align the long axis of the image on the long axis of the paper (*landscape format* — the factory default), enter:

HCORIENT HORIZONTAL

- To align the long axis of the image on the short axis of the paper (*portrait format*), enter one of the following:

HCORIENT VTOP

HCORIENT VCENTER

HCORIENT VBOTTOM

These three commands place the image at the top, center, or bottom of the paper, respectively.

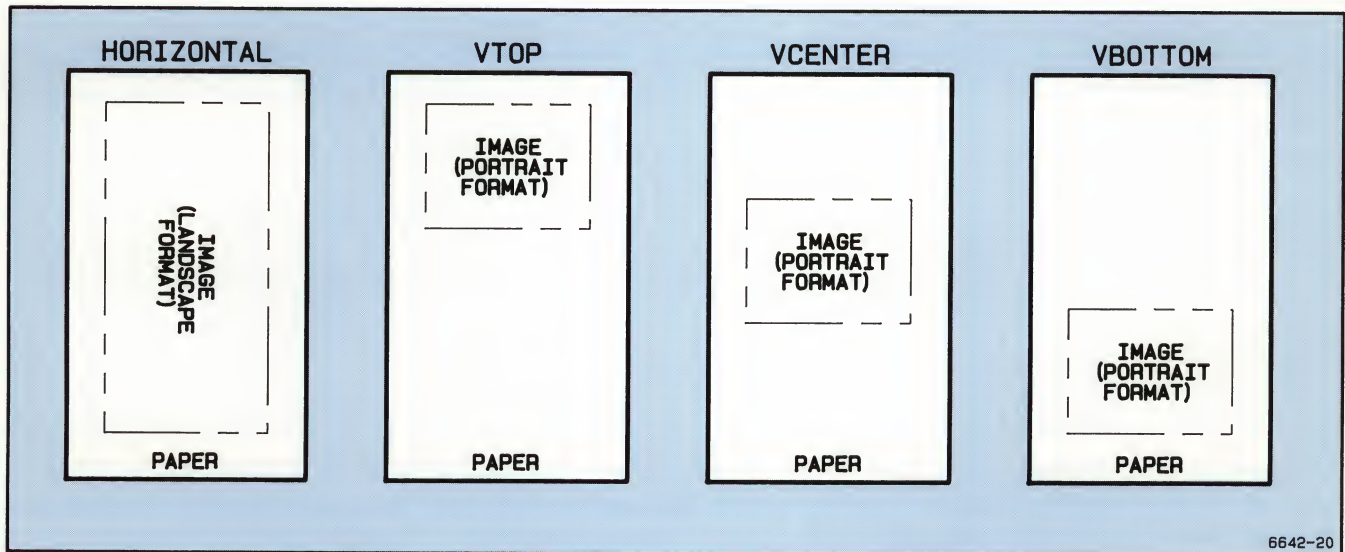


Figure 5-1. Orientation of Copier Images.

CONTROLLING IMAGE SIZE

You can control the size of the image sent to the color copier in several ways, depending on which copier you are using.

- Use the HCSIZE command for dialog copies only, to select the image size on your copier or printer.
- Use the HCFORMWIDTH command if you want to make a portrait oriented copy on 10" paper using the 4696.
- Use the HCDENSITY command if you wish to affect the size and brightness of a 4692 copy.
- Use the HCFEATURES command to change image size on a 4693D.

Using HCSIZE

If you are making a copy on any of the printers or copiers in the following list, the HCSIZE command controls the dialog copy size. However, this command only has an effect when the Tek light is on.

- TEKTRONIX 4692 Color Graphics Copier
- TEKTRONIX 4693D Color Image Printer
- TEKTRONIX 4696 Color Graphics Copier
- TEKTRONIX ColorQuick Printer
- TEKTRONIX 4644 Printer
- Alps ALQ324e Printer
- DEC LA210 Letterprinter
- DEC LN03 Laser Printer
- Epson FX-80 Printer
- Epson LQ-2500 Printer
- Hewlett-Packard DeskJet
- Hewlett-Packard LaserJet+
- Hewlett-Packard LaserJet Series II
- Hewlett-Packard ThinkJet

The small copy size allows you to copy 132 columns on the same line. In a standard-sized copy of text with a 132-character line, the copier will print only as many characters as it can on one line, and the remaining characters truncate or wrap to the next line (the actual number that wraps depends on the copier).

(If you are using a 4696 Copier, and want to make a 10" copy, see the next discussion "HCFORMWIDTH.")

Here's how to specify the copy size using HCSIZE:

- To select the small copy size, enter:

HCSIZE 1

- To select the standard copy size (the factory default), enter:

HCSIZE Ø

NOTE

When you specify the small copy size for dialog copies on a 4696, the copy prints on a smaller area of paper — that is, there are fewer blank lines after the copy, which reduces the size of the output. If you want the small copy to print on standard-sized output, you must also issue this command:

HCFEATURES 2,3,3,47,4,6Ø

The HCFEATURES command is described later in this discussion.

Using HCFORMWIDTH (4696)

To use a 4696 Copier with 10" paper to make a full screen copy, enter the following command:

HCFORMWIDTH 1

This allows you to make a full size screen copy on 10" paper, using either landscape or portrait format (described previously in the "HCORIENT" discussion).

To use a 4696 copier with 8½" paper to make a full size screen copy in landscape format, enter the following command:

HCFORMWIDTH Ø

ADJUSTING HARDCOPY COLOR

How each color is depicted on a hardcopy depends on the mix of colors used for each pixel. You can select whether the pixels will be restricted to the eight primary colors or will be *dithered* to create the numerous colors. Dithering prints dots of different colors close together to create the appearance of another color — in actuality, your eye blends these dots to perceive a single color. For example, to create purple, a printer can print a series of cyan dots and magenta dots to create the visual effect of purple.

You can select dithering on the printer using the HCDITHER command. If you are using a black and white printer, HCDITHER will result in a gray scale. The HCFEATURES command allows you more control over how colors are mixed.

Using HCDITHER

To invoke dithering, enter:

```
HCDITHER 1
```

Entering HCDITHER 1 actually causes the 4211 to issue a HCFEATURES 6 command to dither without enhanced black.

Controlling Pixel Color Using HCFEATURES 6

You can control the color in which each pixel is printed using HCFEATURES 6. This command gives you the following options:

- Use the printer settings (4693D only)
- Print each pixel in the closest primary color
- Dither, that is, print adjacent pixels with dots of different colors to create the illusion of another colors (either with black or without black — if the printer does separate printing passes for cyan, magenta, yellow, and black the resulting black is called *enhanced*)
- Print in black and white only
- Print in black and white and shades of gray

Refer to the *4210 Series Command Summary* for more HCFEATURES command information.

If you are using a 4693D, the default HCFEATURES setting is to make the copy according to the printer setting. If you use HCFEATURES, that choice overrides the setting made at the printer.

If you are not using a 4693D, the default is to print each pixel in the closest primary color.

The following examples help illustrate how to use this feature.

- If your image uses only a little black, use dithering without enhanced black (enhanced black means that the printer does separate printing passes for cyan, magenta, yellow and black). Enter:

```
HCFEATURES 6,2
```

The 6 invokes the color palette feature, and the 2 specifies that dithering without enhanced black is used.

- If your image has a lot of solid black areas or the black in your copies is not dense enough or dark enough, use dithering with enhanced black:

```
HCFEATURES 6,3
```

The 6 invokes the color palette feature, and the 3 that dithering with enhanced black is used.

- If your application contains a lot of solid lines or requires precise line quality, use the eight primary colors:

```
HCFEATURES 6,1
```

The 6 invokes the color palette feature, and the 1 specifies that each pixel be printed in the closest one of the eight primary colors (black, red, yellow, green, cyan, blue, magenta, white).

For example, if the color displayed is close to red, the pixel is printed in full red. The only exception is white. If the white shown is not pure white, the pixel is printed in black.

- To specify that the 4693D front panel setting defines the pixel color rendition, enter:

```
HCFEATURES 6,Ø
```

The 6 invokes the color palette feature, and the 0 switches control of this setting from the 4211 to the front panel of the 4693D Color Printer. See the *4693D Operator Manual* for information on adjusting the front panel settings.

SELECTING MEDIA TYPE ON A COLORQUICK PRINTER

You can use the HCFEATURES 10 command to select the type of media on a ColorQuick Printer. However, you must load the printer with the correct media before issuing a copy command because it starts making copies on whatever media is loaded immediately after receiving the copy command.

- To create a transparency, be sure the printer is loaded with transparencies, then enter:

```
HCFEATURES 10,2
```

The 10 invokes the media type feature and the 2 specifies transparency.

- To make a paper copy, be sure the printer is loaded with paper, then enter:

```
HCFEATURES 10,1
```

The 10 invokes the media type feature and the 1 specifies paper.

REPRESENTING COLORS ON A MONOCHROME GRAPHICS PRINTER

On a monochrome graphics printer, all indices except Index 0, which is usually the background color, print in black ink. If this makes the screen copy hard to read, use the HCMAP command to suppress the printing of selected indices. This can be used only when HCFEATURES 6 is set for printing in the primary colors or in black and white.

To suppress printing of an index, issue HCMAP followed by the index and then a 0 — 0 specifies "no print," while 1 specifies *print*. (Since all indices except Index 0 print by factory default, you need only specify those indices that you don't want to print.)

For example, to suppress printing of Indices 5, 6, and 7, enter:

```
HCMAP 5,0,6,0,7,0
```

Now, everything displayed in Indices 5, 6, and 7 on the screen is not printed on the hardcopy, while all other indices are printed. (You can find the index number of a color in the table "Color Indices for the Dialog Area" in Section 7.)

COPYING MULTIPLE PAGES FROM THE DIALOG BUFFER

The HCDAATTRIBUTES command lets you copy to a color copier or monochrome printer more of the dialog buffer text than just that displayed on the screen.

This command only has effect when the Tek light is on.

The HCDAATTRIBUTES command has three parameters:

1. *Number of pages to be copied.* (The factory default is 1, but you can copy as many pages as the buffer will hold.)
 2. *Starting page to begin the copy.* (The copy can begin at either the beginning or end of the dialog buffer, or at the beginning of the text displayed on the screen.)
- Your options are:
- 0 — To copy from the first line on the screen (the factory default).
 - 1 — To copy from the top of the dialog buffer.
 - 2 — To copy from the bottom of the dialog buffer.
3. *When to begin a new page.* (You can specify a page break after each 60 lines of text, wherever a Form Feed character occurs, or both.) For some copiers, this parameter is affected by the HCFEATURES command, which is described later in this section.

Your options are:

- 0 — If you are using a 4692, breaks pages every 66 lines (60 lines of text plus three blank lines each at the top and bottom margins, making a total page length of 66 lines) — this is the default. If you are using a continuous-feed copier, breaks pages at the current HCFEATURES setting for page length (66 lines by default).
- 1 — Breaks pages as though this parameter were set to 0, but also breaks pages at Form Feed characters (all copiers).
- 2 — Breaks pages only at Form Feed characters (all copiers).

The following examples show how the HCDAATTRIBUTES command works (for copiers that are affected by the HCFEATURES command, it is assumed in these examples that the HCFEATURES command is at its factory default values):

- To copy the three most recent pages, ignore Form Feeds, and page the copy every 60 lines, enter:

```
HCDAATTRIBUTES 3,2,0
```

The 3 (first parameter) specified three pages to be copied. The 2 (second parameter) causes the page count to start from the last line (most recently entered) of the dialog buffer. The 0 (third parameter) causes a new page to begin every 60 lines of text (66 lines total — 60 text plus 3 lines each at the top and bottom of a page).

- To copy two pages starting from the first line displayed on the screen and to start a new page every 60 lines of text or wherever a Form Feed occurs, enter:

```
HCDAATTRIBUTES 2,0,1
```

- To copy the five oldest pages and start a new page only at every Form Feed, enter:

```
HCDAATTRIBUTES 5,1,2
```

Keep in mind that the first setting (the number of pages) and the last setting (whether Form Feeds are ignored) affect one another. If the dialog buffer begins with four Form Feeds, and you specify that the copier or printer should print four pages and break pages only at Form Feeds, you would get four blank pages.

Or, assume you set the 4211 to page only on Form Feeds and you set the number of pages to 1. If there are no Form Feeds in the text, the entire dialog buffer will be copied without page breaks, regardless of the number of lines.

PAGING FOR CONTINUOUS-FEED COPIERS

If you are using a continuous-feed copier for dialog copying, you can specify how many lines of text should be on each page as well as how many blank lines you want at the top and bottom margins. If you are using a continuous-feed copier for screen copying, you can specify a paper advance between each copy. (Continuous-feed copiers feed paper from one continuous roll or a stack of perforated paper.)

The HCFEATURES command gives you these capabilities. To use the command for paging, enter both a *feature number* and the value you want to assign to it. Table 5-2 describes the feature numbers that control pagination, what devices and types of copying each feature controls, and the values for each feature.

The following examples help illustrate how to use HCFEATURES for paging:

- To specify four lines each at the top and bottom margins, enter:

```
HCFEATURES 2,4,3,4
```

The 2 identifies which feature you are specifying (in this case, top margin), and the 4 that follows specifies that you want four lines at the top margin. The next 3 and 4 specify a bottom margin of four lines.

- To specify a six-line top and bottom margin with 44 lines of text (for a typical 66-line copy), enter the following command:

```
HCFEATURES 2,6,3,6,4,44
```

- To advance the paper after a screen copy, enter the following command:

```
HCFEATURES 5,1
```


Using Printers, Plotters, and the Rasterizer

Customizing Copies

You will probably want to figure out how you want copies paged and then save those settings. After you have issued the HCFEATURES command settings, just enter:

NVSAVE

Of course, any time you want to temporarily override those settings, just issue HCFEATURES with the new settings. The next time you turn on or reset the 4211, the HCFEATURES settings will revert back to those saved in nonvolatile memory.

NOTE

Procedures to paginate dialog copies are more applicable when the 4211 is in RS-232-C communications, since this host port setting allows you to specify large dialog buffers. In coax communications, the dialog buffer is limited to 32 lines (although you can still use this command to break the 32 lines into pages).

Table 5-2
USING HCFEATURES FOR PAGING

Feature	Function	Type of Copy	Type of Copier	Valid Values ^a	Default Value
1 Memory for Background Copying	Turns background copying on and off	Screen	All	0 — 65535	0
2 Top Margin	Controls the number of blank lines at the top of each page	Dialog	Continuous-feed only	0 — 32767	3
3 Bottom Margin	Controls the number of blank lines at the bottom of each page	Dialog	Continuous-feed only	0 — 32767	3
4 Text Length	Controls the number of lines of text on each page	Dialog	Continuous-feed only	0 — 32767	60
5 Advance	Controls whether paper should advance between each screen copy	Screen	Continuous-feed only	0 (no advance) 1 (advance)	0

^aThe valid values shown are the entire range that can be issued without generating an error; however, you would normally use values close to the default values. Usually, the sum of the text length plus the top and bottom margins is 66 lines.

HOW TO COPY FROM A HOST TO A PERIPHERAL DEVICE

You can send text or graphics directly from the host to a peripheral device without displaying the image on the screen. This is convenient for sending program listings from the host to a monochrome copier.

To route a copy from the host directly to a peripheral device, follow these steps:

1. Make sure the 4211 is connected to the host and to the peripheral, and both are powered on. (Section 2 tells how to install and prepare peripherals for use.)
2. Before entering Setup, type whatever command the host requires to send text to the 4211, but do not type the key the host needs to terminate the command (usually the Return [Enter] key).
3. Enter Setup.
4. Type in the COPY command and the desired destination. For example, this command would send data from the host to a device connected to PORT 0:

```
COPY HO: , TO, P0:
```

(Be sure to press the Return [Enter] key to terminate this command.)

5. Exit Setup.
6. Now terminate the host command you entered in Step 4.

NOTE

Because the 4211 does not process the data, it is the responsibility of the host to send it in a format acceptable to the receiving peripheral. For example, if the data stream doesn't include an EOF string, the peripheral will not know that the copy operation is complete. If this occurs, press the Cancel key to terminate the copy operation.

NOTE

*While the 4211 is in coax communications, you cannot send 3270-style alphanumerics from a host directly to a peripheral. The 4211 can, however, pass graphics from the host directly to a peripheral. Refer to the **4210 Series Programmers Manual** for details about Tektronix graphics and 3270 communications.*

SELECTING CHARACTER SETS FOR THE PRINTER

You can use the HCCHARSETS command to override the choice of character sets made when you issue a HCINTERFACE command. For instance, HCINTERFACE 3 configures the 4211 for driving an Epson FX-80 printer with switches set to select the 7-bit ASCII character set. The North American character set is automatically invoked.

You could change these settings by issuing the following commands:

```
HCINTERFACE 3
HCCHARSETS /G0,94,K/
NVSAVE
```

The HCINTERFACE command tells the 4211 that an Epson FX-80 printer is installed and that the printer uses the North American character set.

The HCCHARSETS command overrides the HCINTERFACE character set selection with the German character set for the printer.

NVSAVE saves the setting in nonvolatile memory.

Table 5-3 shows the value entry required to select each character set — you can select a character set to be the *primary* (G0), *alternate* (G1), *second alternate* (G2) set or *third alternate* (G3) set. If you will be selecting more than the primary set, all sets must be assigned in one command line. For example, HCCHARSETS /G0,94,B;G1,96,A/ selects ASCII as the G0 set and ASCII Supplemental as the G1 set.

Your choice of character sets is limited by the features of your printer.

The HCCHARSETS command controls the printed character sets. The character set on the display is controlled by using the SELECTCHARSET command. Refer to Section 8 of this manual for information about the SELECTCHARSET command.

Table 5-3
VALUES FOR THE HCCHARSETS COMMAND

Character Set	Assign as G0	Assign as G1	Assign as G2	Assign as G3
North American (ASCII)	/G0,94,B/	/G1,94,B/	/G2,94,B/	/G3,94,B/
Danish/Norwegian	/G0,94,/	/G1,94,/	/G2,94,/	/G3,94,/
French	/G0,94,f/	/G1,94,f/	/G2,94,f/	/G3,94,f/
German	/G0,94,K/	/G1,94,K/	/G2,94,K/	/G3,94,K/
Greek	(none)	/G1,96,F/	/G2,96,F/	/G3,96,F/
Italian	/G0,94,Y/	/G1,94,Y/	/G2,94,Y/	/G3,94,Y/
JIS Katakana	/G0,94,l/	/G1,94,l/	/G2,94,l/	/G3,94,l/
JIS Roman	/G0,94,J/	/G1,94,J/	/G2,94,J/	/G3,94,J/
Spanish	/G0,94,Z/	/G1,94,Z/	/G2,94,Z/	/G3,94,Z/
Swedish	/G0,94,G/	/G1,94,G/	/G2,94,G/	/G3,94,G/
Swedish Names	/G0,94,H/	/G1,94,H/	/G2,94,H/	/G3,94,H/
Swiss-German	/G0,94,=/	/G1,94,=/	/G2,94,=/	/G3,94,=/
United Kingdom	/G0,94,A/	/G1,94,A/	/G2,94,A/	/G3,94,A/
DEC Rulings	/G0,94,0/	/G1,94,0/	/G2,94,0/	/G3,94,0/
DEC Supplemental ^a	/G0,94,</	/G1,94,</	/G2,94,</	/G3,94,</
DEC Technical	/G0,94,>/	/G1,94,>/	/G2,94,>/	/G3,94,>/
Tektronix Supplemental ^b	/G0,94,3/	/G1,94,3/	/G2,94,3/	/G3,94,3/
Tektronix 4696 Supplemental	(none)	/G1,96,#0/	/G2,96,#0/	/G3,96,#0/
Tektronix ColorQuick Supplemental	(none)	/G1,96,#2/	/G2,96,#2/	/G3,96,#2/
HP Supplemental	/G0,94,#1/	/G1,94,#1/	/G2,94,#1/	/G3,94,#1/
ASCII Supplemental ^c	(none)	/G1,96,A/	/G2,96,A/	/G3,96,A/

^aUse only with a VT200 keyboard.

^bFormerly called Supplementary Character Set.

^cFormerly called Multilingual Character Set.

USING THE 4693D COLOR IMAGE PRINTER

The information presented here applies only to the TEKTRONIX 4693D Color Image Printer and gives specific details about many of the special features available on the 4693D. The general information presented earlier in this section under "Customizing Your Copies," is also applicable to the 4693D.

CONTROLLING BLACK AND WHITE REVERSAL

You can control how black-white reversal occurs on a 4693D by using HCFEATURES 12. This command has the following options:

- Use the printer settings
- Use parameters from the HARDCOPY command or the copy keys
- Always reverse black and white
- Never reverse black and white

Refer to the *4210 Series Command Summary* for more information on the HCFEATURES command.

The default HCFEATURES setting is to make the copy according to what the HARDCOPY command or the copy key dictates. In other words, the 4693D's default setting is to print the colors in whatever way the 4211 sends them.

If you share the 4693D with other users, you probably don't want to rely on the printer settings because someone may have changed them. In that case, you can use the HCFEATURES default setting instead of the current printer settings.

If the host program sets the HCFEATURES parameters, you may not see any difference between using SCopy and Ctrl-SCopy on the 4211 since the copy features are under the control of the program. If you or your program make any other choice for this HCFEATURES setting, it will override whatever the HARDCOPY command or copy key dictates.

The following examples help illustrate how to control black and white reversal:

- To control black-white reversal from the 4693D's front panel, enter in Setup:

```
HCFEATURES 12, 0
```

The parameters 12 and 0 define the 4693D as the source for current printer feature settings. See the *4693D Operator Manual* for information on adjusting the front panel settings.

- To reverse black and white every time you make a hardcopy, regardless of what the host program specifies and regardless of what key sequence you use to request the copy, enter in Setup:

```
HCFEATURES 12, 2
```

The 12 invokes the black-white inversion feature, and the 2 specifies that the colors be reversed in the copy.

SELECTING IMAGE ORIENTATION

In addition to the four image positions already described under "Selecting Image Orientation," you can control image orientation using the printer settings on the front panel of the 4693D. Use the following command:

```
HCORIENT PRINTER
```

The orientation of the screen image will be controlled by the settings on the front of the 4693D.

CONTROLLING IMAGE SIZE USING HCFEATURES 11

You can control the size of the image the 4693D puts on paper or transparency using HCFEATURES 11. This command has the following options:

- Use the printer settings
- Create a small image based on one-to-one pixel mapping from the screen to the hardcopy
- Print the largest image which will fit on the hardcopy
- Create an image that is proportionally true to the screen image

Refer to the *4210 Series Command Summary* for more HCFEATURES command information.

The default HCFEATURES setting is to select the size based on the printer settings. The default setting of the 4693D is to print the image to fill the media.

The following examples show how you might use this feature:

- If the image is distorted or if it consists largely of lines, consider changing the sizing. Enter the following:

```
HCFEATURES 11,2
```

11 invokes the size feature, *2* specifies an image proportionally true to the original.

- If you want to make a very small image, enter:

```
HCFEATURES 11,1
```

11 invokes the size feature, *1* specifies one-to-one pixel mapping. This results in a very small image on the paper.

- To specify that the 4693D front panel setting define the image size, enter:

```
HCFEATURES 11,0
```

The *11* invokes the image size feature and the *0* switches control of this setting from the 4211 to the front panel of the 4693D. See the *4693D Operator Manual* for information on adjusting the front panel settings.

SELECTING MEDIA TYPE AND SIZE USING HCFEATURES 9 AND 10

You can specify the size and the type of media on a TEKTRONIX 4693D or on a Hewlett-Packard DeskJet or LaserJet by using HCFEATURES 9 and 10. The following choices are available:

- Use the printer settings
- Use whatever media is loaded
- Specify a size of media such as legal size or standard size
- Select paper or transparency

Refer to the *4210 Series Command Summary* for more HCFEATURES command information.

The 4693D uses more heat to make a transparency than to make a paper hardcopy. A lever on the 4693D (near where you load the media) controls this level of heat. This lever is the only means for adjusting this temperature. Be sure the media type (paper or transparency) requested with HCFEATURES corresponds with the position of the lever.

If the media you specify is loaded, the 4693D takes about two minutes to print the first copy and about one minute to print each additional copy. If the specified media is not loaded the 4693D waits about ten minutes after the copy command to allow you to change the media. If you do not change the media within this ten minute period, it proceeds to make the copies on whatever media is loaded.

The following examples show how to use these features:

- To create a transparency, enter:

```
HCFEATURES 10,2
```

The *10* invokes the media type feature and the *2* specifies transparency. (Be sure the lever on the printer is set to *transparency*.)

- To copy on paper, enter:

```
HCFEATURES 10,1
```

The *10* invokes the media type feature and the *1* specifies paper. (Be sure the lever on the printer is set to *paper*.)

- If you use different sized media and you don't want to change this setting all the time, you can use the option *use loaded media*. This option enlarges the graphics images to fill the media that is loaded, leaving a border. To do this, enter:

HCFEATURES 9,1

The 9 invokes the media size feature and the 1 specifies that whatever media is loaded be used.

- If you're using standard 8½" paper, enter:

HCFEATURES 9,2

The 9 invokes the media size features, and 2 specifies standard paper.

- You can combine the media type and size features in one entry. For instance, to use standard sized transparencies, enter:

HCFEATURES 9,2,10,2

The parameters 9,2 specify the standard 8½" size. The parameters 10,2 specify transparency.

- To specify that the 4693D front panel and lever settings define the media type and size, enter:

HCFEATURES 9,0,10,0

The 9 invokes the media size feature and the 0 switches control of this setting from the 4211 to the 4693D Color Printer. (See the *4693D Operator Manual* for information on adjusting the front panel settings.) The 10 followed by the 0 leaves definition of the media type to the 4693D.

LIGHTENING OR DARKENING COPIES USING HCFEATURES 7 AND 8

You can control how light or dark the 4693D makes a copy by using HCFEATURES 7 and 8. The two features, color manipulation and color conversion, work together to correct the *gamma* — that is, the difference between how different devices show color. When adjusting one, keep in mind that its effect will be modified by the setting of the other.

HCFEATURES 7 and 8 give the following options:

- Use the printer settings
- Turn off the features
- Use the printer gamma correction
- Specify the video gamma value

Refer to the *4210 Series Command Summary* for more HCFEATURES command information.

The following examples help illustrate how to use this feature.

- If the copy is too light, first try selecting printer gamma correction:

HCFEATURES 7,3

The 7 invokes the color manipulation feature, and the 3 requests the printer gamma correction.

- If a copy is still too light, be sure there is no *video* (not printer) gamma correction set:

HCFEATURES 8,1

The 8 invokes the video gamma feature and the 1 specifies no setting.

- If the copy is too dark, try selecting video gamma and turning off color matching:

HCFEATURES 8,3,7,1

The 8 and 3 specify a particular video gamma correction. The higher the video gamma setting, the lighter the hardcopy. You may have to experiment to determine the proper correction factor for your particular application. The 7 and 1 turn off the color matching feature.

- To specify that the 4693D front panel setting defines the way color is reproduced, enter:

HCFEATURES 7,0

The 7 invokes the color manipulation feature and the 0 switches control of this setting from the 4211 to the front panel of the 4693D Color Printer. See the *4693D Operator Manual* for information on adjusting the front panel settings.

USING THE 4692 COLOR GRAPHICS COPIER

The information presented here applies only to the TEKTRONIX 4692 Color Graphics Copier and gives specific details about many of the graphics features of the 4692. The general information presented earlier in this section under "Customizing Your Copies," is also applicable to the 4692.

SELECTING DOT DENSITY USING HCDENSITY

You can select the dot density of the copy (that is, the resolution) on a 4692 Copier with the HCDENSITY command. High-density copies are sharp, detailed, and smaller; low-density copies are larger and are produced more quickly.

- To produce higher density, smaller copies (the factory default), enter:

```
HCDENSITY HIGH
```

- To produce lower density larger copies, enter:

```
HCDENSITY LOW
```

USING HCDATARES

When you make a copy on a 4692 without dithering, use the HCDATARES command for compatibility with other Tektronix terminals.

The only recommended setting is the factory default setting:

```
HCDATARES 1
```

OVERWRITING WITH HCREPAINT

On the 4692 Copier, you can choose how many times (from one to four) the copier overwrites the image in a copy. Writing the same image several times in the same copy adds a heavier concentration of ink. You might find this useful when you create transparencies, since more ink produces more intense colors.

For example, to overwrite an image two times, enter the following command:

```
HCREPAINT 2
```

The image is overwritten twice, which produces a more saturated copy of the image.

MAKING TRANSPARENCIES

To make high-quality transparencies on a 4692 Copier, use this sequence of settings:

```
HCORIENT HORIZONTAL  
HCDENSITY HIGH  
HCREPAINT 2  
HCDATARES 1
```

USING THE 4510A RASTERIZER

Using the TEKTRONIX 4510A rasterizer, you can copy the graphics area to a 4690 Series Copier with greater resolution than when copying directly from the screen to the copier. The rasterizer also gives you a wider color selection.

You can use the rasterizer only on images that were created using segments. A segment is a collection of lines and attributes that have been defined as a unit so that they can be treated as a single object. If the image was not created as segments, you can use Setup commands to display the image as a segment (explained below).

Follow these steps for making a rasterized copy:

1. Be sure the rasterizer is connected to the 4211, the color copier is connected to the rasterizer, and all are powered on. (Section 2 tells how to connect the rasterizer and a color copier.)
2. Put the 4211 in Setup, if it isn't already.
3. Be sure the dialog area is enabled so the commands won't clutter the graphics:

DAENABLE YES

4. Display your image and be sure it is comprised of segments.

If the host program does not display graphics as segments, you can make a segment out of the entire display (if the display has been created with graphics primitives) by opening a segment before the host displays the graphics, then closing the segment after the graphics are drawn. Like this:

- a. Open a segment (in this case, Segment 1) by entering:

SGOPEN 1

- b. Take the 4211 out of Setup.
- c. Enter the commands required by the host to display graphics on the 4211.
- d. After the image is on the screen, return the 4211 to Setup.
- e. Close the segment by entering:

SGCLOSE

5. Make sure the image is in the current view.

If you have more than one view of the screen, the image in the current view will be sent to the rasterizer. Refer to "How to Use the Zoom/Pan Functions" in Section 6 for information on entering Zoom and Pan, selecting views, and returning to Setup.

6. Specify the number of copies. For example, if you want three copies, enter:

PCOPIES P0:,3

(If the rasterizer is connected to PORT 1, use P1 instead of P0 in the commands you enter for both Steps 6 and 7.)

7. Start the copy process by entering:

PLOT TO P0:

The preceding steps use existing settings for copy orientation and appearance, but you can change these settings to fit your copy needs. The commands to do so are discussed under "Customizing Rasterized Copies" just ahead.

COPYING FROM A HOST TO THE RASTERIZER

You can use the COPY command to send graphics from a host directly to the rasterizer without displaying the graphics on the screen.

Use the method described under "How to Copy From a Host to a Peripheral Device" in this section as a guide.

CUSTOMIZING RASTERIZED COPIES

You can control how the rasterized copy is oriented on the paper (or other media) and whether black and white are reversed. The commands to change the default settings are described next.

You can save settings made with these commands (see "Saving Command Settings" in Section 3), or reissue them whenever you make a copy. If you need to switch frequently from one type of copy to another, you can program keys to select the different settings needed. (See "How to Program Tek Keys" in Section 7.)

Because the rasterizer takes care of other copier details such as resolution, color matching, and so forth, you don't need to adjust these settings as you do when sending copies directly to the color copiers.

PORIENT — Image Orientation for Rasterized Copies

You can select the orientation of the screen image on the copier paper using one of the following commands.

This procedure assumes the rasterizer is connected to PORT 0. If it is connected to PORT 1, substitute P1 wherever P0 is shown in a command.

- To align the long axis of the image on the long axis of the paper (*landscape format* — the factory default), enter:
- To align the long axis of the image on the short axis of the paper (*portrait format*), enter one of the following:

```
PORIENT P0:HORIZONTAL
```

```
PORIENT P0:VTOP  
PORIENT P0:VCENTER  
PORIENT P0:VBOTTOM
```

These three commands place the image at the top, center, or bottom of the copier paper, respectively.

PINVERSION — Reversing Black and White on Rasterized Copies

You can select how black and white colors in the image will be copied by entering one of these commands. Reversing black and white may be useful when the screen text is white on a black background. The text will print as black on a white background like normal typewriter or printer copies, and it will save black ink. Be aware, however, that *all* black and white colors in the image will be reversed. Other colors are not affected.

This procedure assumes the rasterizer is connected to PORT 0. If it is connected to PORT 1, substitute P1 wherever P0 is shown in a command.

- To make a copy with black and white reversed, enter:

```
PINVERSION P0: NEGATIVE
```

- To keep the image's blacks and whites as displayed on the screen, enter:

```
PINVERSION P0: POSITIVE
```

PREPAINT — Making Rasterized Transparencies

You can make transparencies on a 4692 printer connected to a 4510 rasterizer. The PREPAINT command allows you to choose how many times (from one to four) the copier overwrites the image in a copy. Writing the same image several times in the same copy gives a heavier concentration of ink.

This procedure assumes the rasterizer is connected to Port 0. If it is connected to Port 1, substitute P1 wherever P0 is shown in a command.

1. Be sure the 4510 rasterizer is installed (see Section 2) and then enter:

```
PREPAINT 2
```

2. Plot the screen image by entering:

```
PLOT TO P0:
```

USING A 4662 OR 4663 PLOTTER

You can use a TEKTRONIX 4662 or 4663 Interactive Digital Plotter to create a plot of all graphics segments that are visible and in the current view.

1. Be sure the plotter is connected and configured for the 4211 and both are powered on. (Section 2 tells how to install and prepare the plotter for use.)

These procedures assume the plotter is connected to PORT 0. If it is connected to Port 1, substitute P1 wherever P0 is shown in a command.

2. Install the plotter pen or pens, and place the paper or transparency on the plotter's surface.
3. Plot the screen image by entering:

```
PLOT TO P0:
```

Assigning Color to Multiple Pens

If the plotter has multiple pens, you can assign color indices to particular pens. Here are three examples:

- To map all displayed color indices (-1) to a single pen (Pen1), enter:

```
PMAP P0: , -1, 1
```

- To map graphics displayed in Index 3 to Pen 2, enter:

```
PMAP P0: , 3, 2
```

Reissue this command for each index you want to map.

- To suppress plotting graphics displayed in a particular color, map that index to Pen 0 — that is, no pen. This is useful when you want a multicolored plot but have a plotter with only one or two pens. The following commands illustrate how you can plot one color at a time.

First, map all color indices to Pen 0:

```
PMAP P0: , -1, 0
```

Then, select a pen color, install the pen, and map one index to that pen. For example, first map Index 8 to Pen 1:

```
PMAP P0: , 8, 1
```

When this plot is finished, install a pen with another color. Then map another index to that pen and remap the index just plotted so that it won't plot. For example:

```
PMAP P0: , 5, 1
```

```
PMAP P0: , 8, 0
```

Replot the image for each index you want to show.

USING AN HPGL-COMPATIBLE PLOTTER

The 4211 firmware incorporates the basic Hewlett-Packard Graphics Language (HPGL) command set. If you have an HPGL-compatible plotter, you can use it to plot a variety of screen graphics from the 4211 such as: graphtext, lines, line styles, two alphanum sizes, and many predefined fill patterns.

The 4211 is compatible with the following HPGL plotters:

- Hewlett-Packard 7475A
- Hewlett-Packard 7550A

In addition, most plotters that are compatible with the HPGL command set will work with the 4211. The following plotters use the HPGL command set:

- Bruning Zeta 800 Series
- Bruning Zeta Zetadraf 900
- Calcomp 1040GT
- Houston Instruments DMP-60
- Ioline LP3700
- Ioline LP4000
- Numonics 5000 Series

HPGL COMMANDS

Most HPGL-compatible plotters use the fill patterns displayed on the 4211 screen. Dithered fill patterns, however, are displayed in a solid pattern (the 4211 determines the color). A few of the fill patterns, like the bricks, are plotted using other patterns that the plotter supports.

You can use an HPGL-compatible plotter that supports all or part of the HPGL commands. Of course, if it doesn't support all the commands, it will be somewhat limited in the variety of graphics it can plot. You can also use a plotter that does not understand the HPGL fill commands, but it will draw only the outlines of patterns.

Following is a list of the HPGL commands that the 4211 supports.

● Character Set Instructions

- **CA** (Designate Alternate Character Set)
- **CS** (Designate Standard Character Set)
- **DR** (Relative Direction)
- **DS** (Designate Character Set into Slot)
- **IV** (Invoke Character Set)
- **LB** (Label)
- **SA** (Select Alternate Character Set)
- **SR** (Relative Character Set)
- **SS** (Select Standard Character Set)

● Pen Moving Instructions

- **PD** (Pen Down)
- **PU** (Pen Up)
- **SP** (Select Pen)

● Line Instructions

- **LT** (Line Type)
- **PT** (Pen Thickness)

● Polygon Instructions

- **EP** (Edge Polygon)
- **FP** (Fill Polygon)
- **FT** (Fill Type)
- **PM** (Polygon Mode)

● Other Instructions

- **AP** (Automatic Pen Operations)
- **SC** (Scale)

PLOTTING GRAPHICS ON AN HPGL PLOTTER

There are several ways to send a graphics image from the 4211 to your plotter. All these methods use either the PLOT or SAVE command which can be issued in Setup or from a host program. However, the image you plot must be composed entirely of segments. (For this discussion it is assumed that the plotter is connected to PORT 0.)

- To plot all segments in the current view, use the PLOT command. (The current view is the default viewport or the one selected by the most recent SELECT VIEW command.) For example, enter the following command:

```
PLOT TO P0:
```

- To plot a particular segment, use the SAVE command with the specific segment number. For example:

```
SAVE SEG 3 TO P0:
```

- To plot all visible segments, regardless of which view they're in, use the SAVE command with -1 as the segment number. For example:

```
SAVE SEG -1 TO P0:
```

If the image you want to plot is not made of segments, you can still plot it; but you must first incorporate it into a segment. The following example shows how to do this.

1. Before displaying the image, enter Setup and issue the following command:

```
SGOPEN 150000
```

2. Exit Setup and display the image using the commands required by your host or application.

3. Enter Setup and issue the following command:

```
SGCLOSE
```

4. To plot the image, enter:

```
PLOT TO P0:
```


INPUTTING AND DISPLAYING GRAPHICS

This section presents information for using graphic input devices. You will also find information on how to use the Zoom/Pan functions to zoom in on and view portions of your display.

Use the following list to locate information in this section:

- If you would like an explanation of how graphic input devices work, see "How to Use Graphic Input Devices."
- If you are using a mouse, thumbwheels, cursor pad, or tablet as your graphic input device, see the appropriate discussion later in this section.
- If you want to study a portion of a displayed graphic, see "How to Use the Zoom/Pan Functions."

HOW TO USE GRAPHIC INPUT DEVICES

Graphic Input (GIN) allows you to use a variety of devices to send graphics coordinates from the 4211 to a host computer.

A host program enables the cursor pad, mouse, or tablet to perform specific graphic input functions, and then prompts you for data. For example, it might tell you to enter a certain number of points on the screen (the *locator* function), to pick a certain *menu item* or part of the picture (the *pick* function), or to enter points continuously every so often, or so far apart (the *stroke* function). To do so, you would use one of the graphic input devices to position the special cursor, called the *GIN* cursor. How you signal the program that the cursor is at the desired position depends on the application program and the input device you are using.

The following instructions allow you to enable one of these devices for graphic input with Setup commands, and then indicate selected points by moving the GIN cursor and pressing a key.

Your application usually enables a GIN device. The following discussions simply illustrate how to enable devices in Setup, and give you the opportunity to become familiar with their use.

To use your particular graphic input device, use the instructions under one of the appropriate heads that follow.

USING THE CURSOR PAD

When you use the cursor pad to control the graphic input (GIN) cursor's movement on the screen, you will press a keyboard key for graphic input. As the arrows on the cursor pad indicate, pressing different edges moves the cursor up, down, left, and right.

1. Enable the keyboard for graphic input.
 - a. Enter Setup (press the Setup key) and then enter the following command:

```
GINENABLE 0,5
```

In the GINENABLE command, the 0 specifies that you'll be using the keyboard, and the 5 means that the 4211 will accept five points.

- b. The GIN cursor (crosshair) appears on the screen.

Now you could enable GIN inking and rubberbanding:

```
GININKING 0,2  
GINRUBBERBAND 0,2
```

- c. Press the Setup key to exit Setup.

The 4211 exits Setup and begins responding to your GIN operations.

If you have enabled *rubberbanding*, an elastic line tracks the GIN cursor as it moves from the origin.

2. Enter a GIN point by pressing down on any keyboard key.

If you enabled *inking*, the 4211 draws a line on the screen from the previous point to the current point.
3. After you enter the last of the points you requested in the GINENABLE command, the 4211 disables GIN and the GIN cursor disappears from the screen.

The speed of the cursor can be controlled by using the GSPEED command — The *4210 Series Command Summary* has information about this command.

You can use the Shift key together with the cursor pad to slow down the cursor movement. This gives you more precision in cursor placement.

Compatibility With Older Applications

If you have an older application which specifies the thumbwheels as the default graphics input device, you may need to enter the following command in order to use the thumbwheels instead of the cursor pad.

```
MOUSEMAP YES
```

If you want to save this setting, enter:

```
NVSAVE
```


USING THE MOUSE OR THUMBWHEELS

When you select either the optional thumbwheels or mouse for your graphic input, check that it is connected to the port at the side of the keyboard.

To use the mouse, lay it on your desk top or other flat surface so that its black rubber ball faces down and its buttons face up. Then, place your hand over the mouse so that the thickest side of the mouse is cupped in your palm and your fingers rest lightly over the buttons.

As you move the thumbwheels, the crosshair cursor on the screen moves in the same direction.

1. Enable the mouse or thumbwheels for graphic input.

Enter Setup (press the Setup key) and then enter the following command:

```
GINENABLE 64,5
```

In the GINENABLE command, the 64 specifies that you'll be using the mouse or thumbwheels, and the 5 means that the 4211 will accept five points.

- a. The *GIN cursor* (crosshairs) appears on the screen.

Now you could enable GIN inking and rubberbanding:

```
GININKING 64,2
GINRUBBERBAND 64,2
```

- b. Press the Setup key again to exit Setup.

The 4211 leaves Setup and begins responding to your GIN operations.

If you have enabled *rubberbanding*, an elastic line tracks the GIN cursor as it moves from the original point.

2. Enter a GIN point by pressing any mouse button or thumbwheels button.
If you enabled *inking*, the 4211 draws a line on the screen from the previous point to the current point.
3. After you enter the last of the points you requested in the GINENABLE command, the 4211 disables GIN and the GIN cursor disappears from the screen.

USING THE TABLET

The TEKTRONIX 4957 and 4958 Graphics Tablets consist of a tablet surface and an attached puck or stylus.

Make sure the tablet is connected either to PORT 0 or PORT 1 on the rear panel of the Graphics module (this procedure assumes the tablet is connected to PORT 0) and that you have entered the PASSIGN command. If not, refer to the installation instructions in Section 2 of this manual.

If you use the stylus, hold it as you would a ballpoint pen, with the tip resting on the tablet. The tablet can keep track of the stylus and send its location to the 4211 as long as the stylus is within 1/2" of the tablet surface.

If you use the puck, lay it flat on the tablet surface with the buttons facing up.

1. Enable the tablet for graphic input.

- a. Enter Setup (press the Setup key) and then enter the following command:

```
GINENABLE 8,5
```

In the GINENABLE command, the 8 specified that you'll be using the tablet, and the 5 means that the 4211 will accept five points.

- b. The *GIN cursor* (crosshairs) appears on the screen.

Now you could enable GIN inking and rubberbanding:

```
GININKING 8,2
GINRUBBERBAND 8,2
```

- c. Press the Setup key again.

The 4211 leaves Setup and begins responding to your GIN operations.

If you have enabled *rubberbanding*, an elastic line tracks the GIN cursor as it moves from the original point.

2. Enter a graphics point by pressing down on the stylus, or the button on the stylus, or by pressing a puck button.
If you enabled *inking*, the 4211 draws a line on the screen from the previous point to the current point.
3. After you enter the last of the points you requested in the GINENABLE command, the 4211 disables GIN and the GIN cursor disappears from the screen.

HOW TO USE THE ZOOM/PAN FUNCTIONS

To fit on the screen, a large image may have to be reduced so much that you can't see its detail. The Zoom/Pan functions let you select a portion of a displayed image — assuming the image is created with segments — and expand it to reveal more of its detail.

NOTE

If you have the Coax option, you can view GDDM images using the Zoom/Pan function. Setting GRESOLUTION to HIGH will result in a sharper, clearer image than GRESOLUTION STANDARD.

To access the Zoom/Pan function, press the Menu key. Then press the F2 key.

When you enter the Zoom/Pan function, Setup is terminated. You can still work with your host, and all keys except F1 through F5 retain their normal function.

The Zoom/Pan menu appears as a banner across the bottom of the screen (see Figure 6-1). This menu shows the unshifted and shifted functions of each of the F1 through F5 keys.

A *framing box* is displayed around the entire graphics area. This framing box represents a *window* onto your image. When you enter local viewing, the window is at its default size.

Inside the framing box and towards the center of the screen is a pair of brackets that form opposite corners of a rectangle. These brackets and the word *ZOOM* highlighted in the menu indicate that Zoom is active.

The following discussions include information on Zoom, Pan, and the function keys.

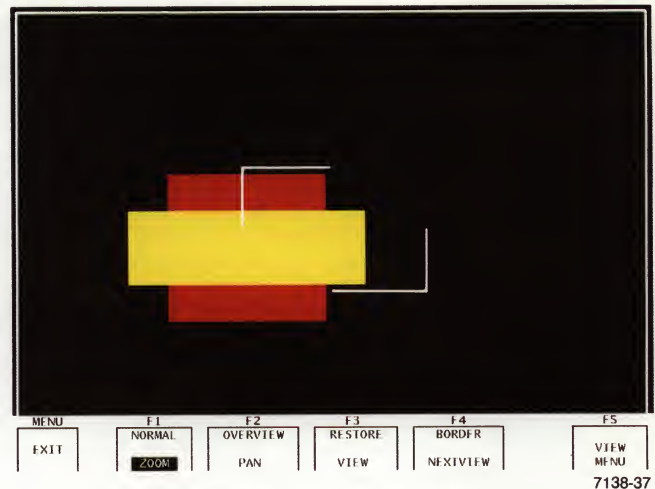


Figure 6-1. Zoom/Pan Menu.

7138-37

USING THE ZOOM FUNCTION

You can increase or decrease the size of the framing box to select how much of the image you want to be displayed. The larger you make the framing box, the farther away the image appears — more of the image is visible, but with less detail. The smaller you make the framing box, the closer the image appears — less of the image is visible, but with more detail.

If you are currently displaying graphics from an application that uses segments, continue on with the next few steps. If not, enter Setup (press the Setup key) and enter the following commands which will display some graphics to Zoom/Pan on. (Section 3 shows you how to enter commands in Setup.)

- To draw a red rectangle:

```
SGOPEN 1
FILLPATTERN -2
BEGINPANEL 1000,1000,1
RECTANGLE 1000,1000,2000,2000
ENDPANEL
SGCLOSE
```

- To draw a yellow rectangle:

```
SGOPEN 2
FILLPATTERN -7
BEGINPANEL 750,1250,1
RECTANGLE 750,1250,2250,1750
ENDPANEL
SGCLOSE
```

Now, if you want to see a portion of your graphic in greater detail:

1. Press on the top or on the right of the cursor pad to increase the size of the framing box.
2. Press on the bottom or on the left of the cursor pad to decrease the size of the framing box.
3. Use the cursor pad to decrease the framing box until it includes only a part of the graphic. See Figure 6-2.
4. Press F3 to update the view. The 4211 redraws the image that was in the framing box, expanding it to fill the entire graphics area as in Figure 6-3.
5. If you want to see the original image, press the Shift-F2 key combination.

Experiment with the Zoom function and refer to Table 6-1 for more function key information.

You can use the Shift key together with the cursor pad to slow down the framing box movement. This gives you opportunity for fine tuning.

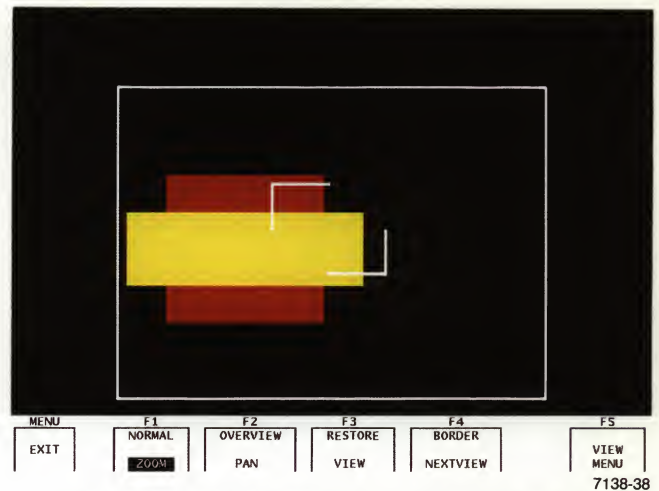


Figure 6-2. Display With Zoomed In Framing Box.

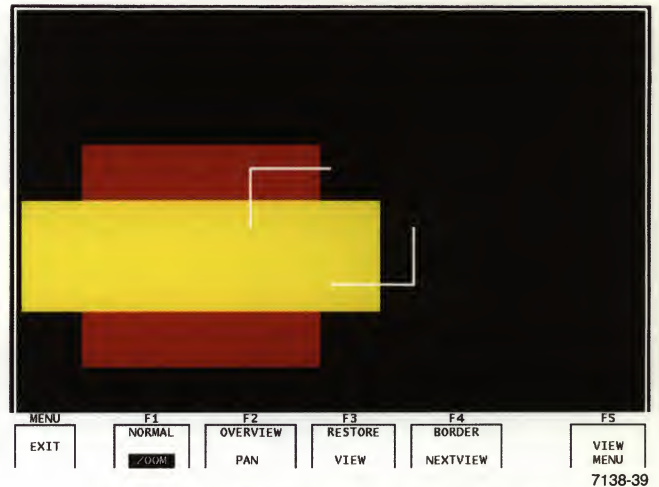


Figure 6-3. Display After Updating the View.

USING THE PAN FUNCTION

The Pan function lets you "roam around" in your image and locate the portion you want to display. In contrast to Zoom, which changes the size of the window, Pan changes the location of the window in which your graphics appear.

If you are currently displaying graphics from an application that uses segments, continue with these steps. If not, refer to the previous discussion "Using the Zoom Function" for a set of commands to build graphics.

Now, to change the location of the window, you'll use the cursor pad to move the location of the framing box.

1. Reduce the size of the framing box while in Zoom, so that the box only covers a portion of the graphic. (Refer to the previous discussion "Using the Zoom Function" for information.)
2. Press F2 to activate Pan. A cross appears and the word PAN in the menu is highlighted.
3. Press the top, bottom or sides of the cursor pad to move the framing box around the image.
4. When the framing box is positioned over the portion of the graphic you wish to see, press F3 to redraw the display. See Figure 6-4.
5. If you move the cross around and press F3 again, you will see a different part of the image, but the framing box and image size do not change as in Figure 6-5.

Remember, you can use the Shift key together with the cursor pad to slow down the framing box movement.

Experiment with the Pan function and refer to Table 6-1 for more function key information.

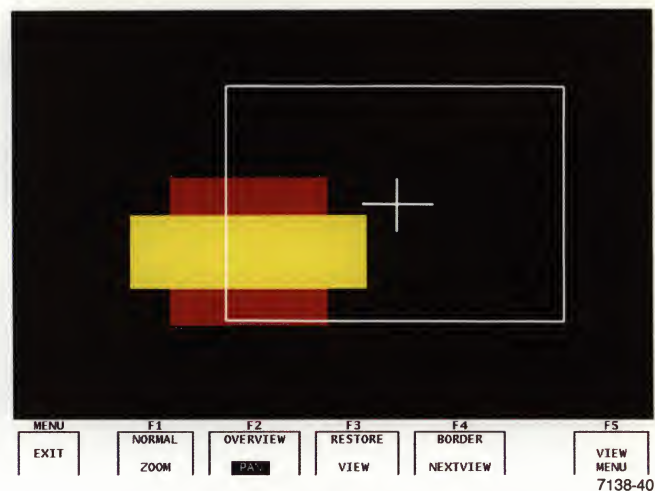


Figure 6-4. Display With Pan.

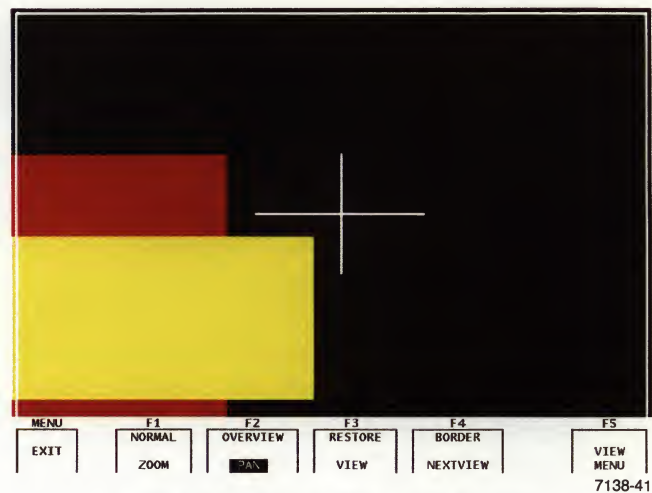


Figure 6-5. Display With Updated View.

FUNCTION KEY SUMMARY

Table 6-1 lists the functions of keys F1 through F5 in Zoom/Pan.

Table 6-1
FUNCTION KEYS IN ZOOM/PAN

KEY	ACTION
F1	ZOOM. Activates Zoom and displays the framing box. Cursor pad changes size of framing box. Pressing F1 again cancels Zoom.
Shift-F1	NORMAL. Returns the framing box aspect ratio to match original window of the current view.
Ctrl-F1	FIXED ZOOM. Equivalent to pressing ZOOM (F1), decreasing the size of the framing box, then pressing VIEW (F3).
F2	PAN. Activates Pan and displays framing box. Cursor pad changes location of framing box. Pressing F2 again cancels Pan.
Shift-F2	OVERVIEW. Selects default window of entire screen for current view and renews current view.
Ctrl-Shift-F2	SUPER OVERVIEW. Selects "super window" that includes all of the terminal space.
F3	VIEW. Sets window for the current view to match the framing box and renews the current view.
Shift-F3	RESTORE. Displays the previous frame.
Ctrl-F3	UPDATE NEXT VIEW. Equivalent to pressing NEXT VIEW (F4), VIEW (F3), then LAST VIEW (Ctrl-F4), in that order.
F4	NEXT VIEW. Saves the status of the current view and makes the next higher numbered view the current one.
Shift-F4	BORDER. Toggles the visibility of the border around the current view.
Ctrl-F4	LAST VIEW. Similar to NEXT VIEW (F4), but selects the next lower numbered view.
F5	VIEW MENU. Turns display of the ZOOM/PAN menu on or off. When the menu is turned off, the dialog area reappears.

HOW TO ZOOM AND PAN WITH MOUSE/THUMBWHEELS

You can use the optional mouse and thumbwheels to perform Zoom and Pan functions. In Zoom, moving the mouse or rolling thumbwheels left or down decreases size of framing box; moving the mouse or thumbwheels right or up enlarges size. Also in Zoom, holding down the Ctrl key during movement changes the aspect ratio of the framing box. In Pan, moving the mouse or thumbwheels positions the framing box.

Table 6-2 identifies the keys used to Zoom and Pan.

Table 6-2
MOUSE AND THUMBWHEEL BUTTONS WITH ZOOM AND PAN

Mouse Button	Thumbwheel Button	Key Emulated	Function Action
LEFT	TOP	F1, F2	Activates Zoom, then toggles between Zoom and Pan.
MIDDLE	MIDDLE	F3	Sets window for the current view to match the framing box and renews the current view.
RIGHT	BOTTOM	Shift-F3	Displays the previous frame (the 4211 can retain up to four frames in memory).

CUSTOMIZING YOUR 4211

In addition to setting communications parameters and peripheral parameters as described in Section 4 of this manual, you can customize your 4211 Graphics Netstation in a variety of areas. For example, you can change dialog area attributes such as the number of dialog lines displayed, or you can change cursor color. Or, you can create macros to assign a task to a particular key.

Most of these customized changes can be saved in nonvolatile memory using the NVSAVE command so that each time you power up your 4211 the saved changes will be in effect.

Refer to Section 3, *Getting Acquainted*, for information on entering commands and saving settings.

Use the following list to locate information you need in this section:

- If you are not familiar with resetting your 4211, the first discussion "Resetting the 4211" will be helpful.
- To change the dialog area buffer size, or cursor color, see "Changing Dialog Area Attributes" for help.
- To change the bell volume or key click on your keyboard, refer to "Changing Keyboard Attributes."
- To create macros, turn to the discussion "How to Program Tek Keys."
- Additional topics covered include locking DEC keys, using the KEYMODE command, and assigning an answerback message.

RESETTING THE 4211

You can use the FACTORY or RESET commands, or the RESET button, to restore settings to their default values. Here are a few other considerations to keep in mind when using these commands:

- When you issue a RESET command, the 4211 assumes its *power-up condition*, which is a combination of the factory default settings and the settings that have been saved in nonvolatile memory with NVSAVE.
- The RESET button performs the same function as issuing a RESET command and also runs Power-Up Self-Test.
- When you issue a FACTORY command, *all* settings revert to their *factory* default values. (The *4210 Series Command Summary* shows the factory default value for each command.) The next time you turn on or reset the 4211, it will assume its power-up condition, using settings saved in nonvolatile memory and using factory defaults for all other settings.

If you have the Coax option, the FACTORY command also selects the factory default host port setting — HOSTPORT COAX — and configures the 4211 for CUT mode. If you are connected to an IBM host when you issue the FACTORY command, the 4211 will log you off. (Current applications are either terminated or suspended depending on your operating system.)

If your 4211 is configured for DFT mode when you issue the FACTORY command, you'll need to return to the Coax Configuration Summary menu and save your DFT settings again (see Section 4).

NOTE

In addition to selecting HOSTPOST COAX, the FACTORY command could change your communications parameters and prevent communications between coax, LAN, and RS-232 hosts — if this happens, Section 4 gives you the information you need to restore 4211/host communications.

- When you enter a FACTORY command and follow it immediately with an NVSAVE command, *all* commands revert to their factory default settings, and any settings that have been saved in nonvolatile memory are lost.

CHANGING DIALOG AREA ATTRIBUTES

The dialog area of your screen displays text — either text you are editing or host-to-4211 dialog. You can control several dialog area attributes such as dialog buffer size, dialog viewport size, and cursor color.

In coax communications, dialog commands apply only to the Tek style dialog area which is used during Setup, Local, and Tek graphics functions. IBM 3270 emulation is done in a separate dialog area where these commands have no effect.

Following are procedures for changing several dialog area attributes.

DIALOG BUFFER SIZE

You can change the number of lines in your dialog area buffer using the DABUFFER command. If you increase the buffer size, you can scroll over an increased number of lines. To change your dialog buffer to 200 lines, use the following procedure:

1. Enter Setup (press the Setup key).
2. Enter this command:
`DABUFFER 200`
3. If you want to save this setting, enter:
`NVSAVE`

If you want to return quickly to a prompt while scrolling through a buffer that is larger than the screen size, press the Dialog key twice (only works when Tek light is on).

(If you are in coax communications, this command does not change the size of your dialog buffer. However, when you switch to RS-232 communications, you will see the changed number of lines.)

Number of Characters per Line

You can also change the width of your dialog buffer using the DAWIDTH command. The width of the line is normally 80 characters (or the dialog viewport width). To make the dialog area buffer 40 characters wide, you would:

1. Enter Setup (press the Setup key).
2. Enter this command:
`DAWIDTH 40`
3. If you want to save this setting, enter:
`NVSAVE`

Your buffer will be 40 characters wide, or approximately half the width of the screen.

VIEWPORT AREA

You control the viewport area size (visible dialog area) and the position of the viewport on your screen. The viewport is actually a defined area of the dialog area buffer which you will view on your screen.

Number of Lines in View

You can change the number of lines displayed in the dialog area viewport using the DALINES command. For example, if you want to display the graphics and only a few lines of text, you would decrease the number of lines displayed.

To set the dialog area size to 30 lines, you would use the following procedure:

1. Enter Setup (press the Setup key).
2. Enter this command:
`DALINES 30`
3. If you want to save this setting, enter:
`NVSAVE`

The number of lines you can request for the viewport area depends on the size of the characters you select using the CHARSIZE command. If the character size is large, the number of lines you can display will be fewer.

You can also control the width of the viewport area with the DACHARS command. There are normally 80 characters in a line. If you set DACHARS to a smaller number such as 40, your viewport will only be half the width of the screen.

Position

You can change the position of the dialog area viewport using the **DAPOSITION** command. For example, if you had set the viewport size to 30 lines using the **DALINES** command, you could then move it to the top of your display using the following procedure:

1. Enter Setup (press the Setup key).
2. Enter this command:

```
DAPOSITION 0,2600
```

3. If you want to save this setting, enter:

```
NVSAVE
```

DIALOG AREA COLOR

Every color you can display is identified by a number called a *color index*. To select a color for text or a graphics element you assign a color index to it.

You can select and change colors for text in the dialog area with the **DAINDEX** command by assigning a color index to it. For example, if you use the command **DAINDEX 0, 3, 3** to select the color indices, the first specified black text (Index 0), in green character cells (Index 3), on a green background (Index 3). (A character cell is the rectangular area surrounding each character.)

When you change colors, you specify a new index number. The factory default colors assigned to the indices are shown in Table 7-1.

Index 0 is slightly different from the others. When you use it in the dialog area for the character cell background or the dialog area background, it is *always* transparent; when used for characters, Index 0 is just like every other index.

Table 7-1
COLOR INDICES FOR THE DIALOG AREA

Index	Default Color Value
0	Black/Transparent
1	White
2	Red
3	Green
4	Blue
5	Cyan
6	Magenta
7	Yellow

CHANGING CURSOR CHARACTERISTICS

Here is some information on changing the type of cursor and the cursor color you are using.

Cursor Type

You control the cursor type with the CURSORTYPE command. You can choose either an underline cursor or a block cursor.

For example, to set the cursor type to block, you would follow this procedure:

1. Enter Setup (press the Setup key).

2. Enter this command:

```
CURSORTYPE BLOCK
```

3. If you want to save this setting, enter:

```
NVSAVE
```

NOTE

When you are in HOSTPORT COAX, use the Alt Cursor key to perform the same function. Refer to "Setting Cursor Type" in Appendix A.

Cursor Color

You control the cursor's color with the ACURSOR command. The command has two parameters that control the two blinking colors.

You can use color index values 0 through 7 to define the colors. (Refer to Table 7-1 in the discussion "Dialog Area Color" earlier in this section for a list of the indices and default color values.)

- For example, to set the cursor colors to red (Index 2) and yellow (Index 7), you would follow this procedure:

1. Enter Setup (press the Setup key).

2. Enter this command:

```
ACURSOR 2,7
```

3. If you want to save this setting, enter:

```
NVSAVE
```

The result is then a cursor alternating between red and yellow.

- If you would prefer a non-blinking cursor, use the same color index twice. To specify a blue cursor, you would enter:

```
ACURSOR 4,4
```

CHANGING KEYBOARD ATTRIBUTES

You can control the keyboard bell's volume (or turn it off entirely) and you can control the type of bell that is sounded when the 4211 receives multiple Bell characteristics. You can also specify a key click for key presses.

Bell Volume

You can control the keyboard's bell volume with the **BELLVOLUME** command. The command has four parameters:

- **OFF** — Turns off the bell
- **LOW** — Sets bell volume to *low*
- **MEDIUM** — Sets bell volume to *medium* (the factory default)
- **HIGH** — Sets bell volume to *high*

For example, to set the bell volume to *low*, you would follow this procedure:

1. Enter Setup (press the Setup key).
2. Enter this command:

```
BELLVOLUME LOW
```

3. If you want to keep the bell volume at this level, save the setting by issuing:

```
NVSAVE
```

Bell Type

You control the keyboard's bell type with the **BELLTYPE** command. Each bell responds differently when sent multiple Bell characters. You can choose from two bells:

- **CONTINUOUS** — Sounds a single, unbroken bell tone (the factory default)
- **DISCRETE** — Sounds a separate bell tone for each Bell character

For example, to set the bell type to *discrete*, you would follow this procedure:

1. Enter Setup (press the Setup key).
2. Enter this command:

```
BELLTYPE DISCRETE
```

3. If you want to save the bell type, enter:

```
NVSAVE
```

Key Click

You can specify a key click for key presses with the **CLICK** command. You can choose between:

- **NO** — Turns key click off
- **YES** — Turns key click on

For example, to turn key click on, you would follow this procedure:

1. Enter Setup (press the Setup key).
2. Enter this command:

```
CLICK YES
```

3. If you want to save key click, enter:

```
NVSAVE
```

NOTE

When you are in HOSTPORT COAX, use the click key to toggle key click on and off — but not in Setup.

HOW TO PROGRAM TEK KEYS

A *macro* is a sequence of characters or commands stored as a single group. By assigning this sequence to a key (known as *programming a key* or *creating a key macro*), you can recall them by simply pressing that key (known as *expanding a macro*).

Macros provide a shortcut for entering commands and text that you use frequently. When you need to enter a particular set of commands or block of text repeatedly, you can create a key macro that contains the commands or text. The 4211 saves the macro in its memory so that whenever you need it, all you need to do is press the programmed key.

All keys except Shift, Ctrl, Tek, Alt, and Lock can be programmed.

NOTE

Avoid programming keys that you normally use to enter commands. For example, if you program the Return [Enter] key, you cannot use it to terminate a command.

The following overview describes the methods for creating macros. Next, we've provided several macros that perform functions you may find useful to have programmed into your keyboard. By programming one or two of these macros into your keyboard, you'll also learn the sequence for creating your own macros.

USING MACRO COMMANDS

There are two commands you can use to create a macro:

- **LEARN** allows you to program keys. When you enter the LEARN command, the 4211 prompts you for your subsequent entries to define the macro. Macros defined with LEARN are lost when the 4211 is turned off or reset, or when you issue a FACTORY command.
- **NVLEARN** works like LEARN, except that NVLEARN macros can be saved in nonvolatile memory by issuing NVSAVE following the macro definition.

SELECTING MACRO COMMAND SYNTAX

Commands within a macro are usually in *host syntax*, rather than in Setup syntax (your *4210 Series Command Summary* explains host syntax). This allows you to use the macro while you are communicating with the host — remember that the 4211 only understands Setup syntax when it is in Setup. When you use host syntax commands in a macro, be sure the 4211 is not in Setup when you press the programmed key.

Commands to the 4211 in a macro can be Setup commands. This, however, requires the 4211 to be in Setup before you press the programmed key. (Remember that you cannot communicate with the host while in Setup.)

SELECTING LOCAL OR HOST MACROS

When you press a programmed key, the macro defined for that key is sent to the host computer — just as if you had entered that sequence of characters on the keyboard. This allows you to avoid typing a sequence of commands you frequently use with your host.

However, you might want a macro to be interpreted as a sequence of commands to the 4211 (rather than the host). For instance, if you frequently use a particular sequence of commands to change a 4211 characteristic (like the size of the dialog area or size of your hardcopies), you could program a key to execute that sequence of commands. In a case like this, you do not want the macro sent to the host, but you do want it executed locally by the 4211.

To construct a local macro, you must include one *key-execute characters* at the beginning of the macro. The default key-execute character is D_L , which you type as *Ctrl-P*. (If you need to use the D_L character within a macro, you'll need to change the default key-execute character — see the KEYEXCHAR command description in your *4210 Series Command Summary*.)

DELETING A MACRO DEFINITION

You can delete a macro and return a key to its default meaning by reissuing the command you issued to create the macro — either LEARN or NVLEARN. In response to the prompt, press the key that contains the macro you want to delete, then press F1. If the macro has been saved (that is, created with the NVLEARN command and followed by an NVSAVE), you would also reissue the NVSAVE command.

For example, to delete a macro that was assigned to the F6 key and was saved in nonvolatile memory, enter Setup (press the Setup key) and enter the following command:

```
NVLEARN
```

The 4211 responds with its prompt:

```
Press the key to be defined:
```

Press the F6 key, then press the F1 key. The F6 key is now back to its default meaning. (With the exception of the function keys, the keycap label on each key identifies its default meaning.)

Finally, issue:

```
NVSAVE
```

CHECKING ON THE STATUS OF MACRO DEFINITIONS

You can display a list of current macro contents by using the MACROSTATUS command.

1. Enter Setup (press the Setup key) and then enter:

```
MACROSTATUS ALL
```

The 4211 lists all the programmed keys and their definitions. Refer to the *4210 Series Command Summary* for keyboard layouts and macro numbers.

2. Press the Setup key to leave Setup.

MACRO EXAMPLES

Here are several macros you might find helpful in your day-to-day work with your 4211. By following the step-by-step procedures for one or two of these examples, you'll also learn the sequence for creating your own macros.

The macros shown here are:

- *Dialog Area Enabling and Disabling* — This macro allows you to disable the dialog area so that you can make clean dialog copies, then re-enable it.
- *Data Logging Macro* — This macro allows you to turn data logging on and off without going into Setup.
- *Block Cursor Enabling and Disabling* — This macro allows you to switch between the block and the line cursor by pressing a key in Setup.

These examples use the NVLEARN command rather than the LEARN command so that you can save these macros in nonvolatile memory. You could substitute *LEARN* wherever you see *NVLEARN*.

If you begin a macro definition with the LEARN or NVLEARN command and want to abort it before completing it, press the Cancel key. If you have completed the macro definition and want to delete it, follow the instructions under "Deleting A Macro Definition" earlier in this discussion.

Enabling and Disabling the Dialog Area

Before copying the dialog buffer, you may want to issue commands to control copy attributes. However, any Setup commands you issue would ordinarily be displayed in the dialog area and printed in the copy. You can avoid this by first disabling the dialog area and making it invisible; then when you issue any Setup commands, they'll be displayed in the graphics area, and won't appear on the dialog copy.

We'll show how to define two macros, one to disable the dialog area and make it invisible and one to re-enable it and make it visible. So that these macros can be saved in nonvolatile memory, we'll use the NVLEARN command (the steps would be just the same with LEARN, but the macros couldn't be saved).

NOTE

Because these macros use Tek host syntax for the commands embedded in the macro, the 4211 must be in CODE TEK for the macros to be executed.

First we'll define a macro on the F3 key to disable the dialog area and make it invisible. Here's how to set up the macro:

1. Enter Setup (press the Setup key)
2. Start defining the macro by entering this command:

NVLEARN

The 4211 displays the following prompt:

Press the key to be defined:

3. Press the F3 function key. The screen displays the macro number for the F3 key (130) after the prompt and displays the following message on the next line:

Enter definition. (F1 terminates definition, F2 deletes last character)
4. Type in this macro definition (using uppercase letters exactly as shown and no spaces between characters):

Ctrl-P **Esc** **KA0** **Esc** **LV0** **Ctrl-P**

(The **Ctrl-P** that begins and ends the definition is the key-execute character, D_L , which causes the macro to be executed at the terminal instead of being sent to the host. **Esc** **KA0** is the host syntax for DAENABLE NO; **Esc** **LV0** is the host syntax for DAVISIBILITY NO.)

The command appears like this on the screen:

$\text{D}_L \text{E}_c \text{KA0 } \text{E}_c \text{LV0 } \text{D}_L$

5. To end the macro definition, press F1.
6. To save the macro in nonvolatile memory, enter:

NVSAVE

7. Exit Setup (press the Setup key)

To create a macro to enable the dialog area and make it visible again, follow the previous steps, but assign the macro to a different function key (consider Shift-F3), and substitute **KA1** for **KA0** and **LV1** for **LV0** when you type in the macro definition:

Ctrl-P **Esc** **KA0** **Esc** **LV0** **Ctrl-P**

To use these macros while making a copy, you would:

- Ensure the 4211 is in TEK mode.
- Press the key (F3) you've programmed to disable the dialog area.
- Enter Setup (press the Setup key).
- Enter the hardcopy commands you require to customize your copy.
- Exit Setup (press the Setup key).
- Press the key (Shift-F3) you've programmed to enable the dialog area.
- Press the DCopy key to make the copy.
- Press the GEras key to erase the hardcopy commands still displayed in the graphics area.

Toggling Data Logging

The 4211's data logging feature (selected with the AUTOPRINT command) causes each line of data written to the dialog area to be printed concurrently on a printer connected to the COPIER port. You can program a single key to toggle data logging (that is, to turn it on or off as needed) rather than having to enter Setup and issue the AUTOPRINT command explicitly.

We'll define a macro on the F8 key to toggle data logging. Again, we'll use the NVLEARN command so the macro can be saved in nonvolatile memory.

NOTE

Because this macro uses ANSI host syntax for the commands embedded in the macro, the 4211 must be in CODE ANSI for the macro to be executed.

Here's how to program the macro:

1. Enter Setup (press the Setup key)
2. Start programming the macro by entering this command:

NVLEARN

The 4211 displays the following prompt:

Press the key to be defined:

3. Press the F8 function key. The screen displays the macro number for the F8 key (I35), and the following message appears on the next line:

Enter definition. (F1 terminates
definition, F2 deletes last character)

4. Type in this macro definition (using upper- and lowercase letters exactly as shown and no spaces between characters):

Ctrl-P **Esc** **[?3i** **Ctrl-P**

(The **Ctrl-P** that begins and ends the definition is the key-execute character, D_L , which causes the macro to be executed at the terminal instead of being sent to the host. **Esc** **[?3i** is the host syntax for AUTOPRINT TOGGLE.)

The command appears like this on the screen:

$\text{D}_L \text{E}_c [?3i \text{D}_L$

5. To end the macro definition, press F1.
6. To save the macro definition in nonvolatile memory, enter:

NVSAVE

7. Exit Setup (press the Setup key)

You can test this macro without a host, but be sure a printer is connected and turned on, then:

1. Check that the 4211 is in Setup, then go into ANSI mode by entering:

CODE ANSI

2. Then check the data-logging status by entering:

STATUS AUTOPRINT

3. Make a note of whether the message says *AUTOPRINT ... YES* or *AUTOPRINT ... NO*, then take the 4211 out of Setup.
4. Press F8 to toggle data logging (if no printer is connected, an error message will be displayed and the data-logging status will not change).
5. Enter Setup again and check the data-logging status:

STATUS AUTOPRINT

The data-logging status should be the reverse of what it was when you checked it in Step 3.

Switching Between a Block Cursor and an Underline Cursor

The 4211's cursor is displayed as either a block or an underscore. You can switch between cursor types by creating macros for use in Setup.

NOTE

Because these macros use Setup syntax for the commands embedded in them, the 4211 must be in Setup for the macros to be executed.

First we'll define a macro on the keypad's decimal point key to select the block cursor. Here's how to set up the macros:

Enter Setup (press the Setup key).

Start defining the macro by entering this command:

NVLEARN

The 4211 displays the following prompt:

Press the key to be defined:

Press the decimal point key on the keypad. The screen displays the macro number for the keypad decimal point key (-65), and the following message appears on the next line:

Enter definition. (F1 terminates
definition, F2 deletes last character)

Type in this macro definition:

CURSORTYPE BLOCK

Press the Return key. Your command appears as follows:

CURSORTYPE BLOCK C_R /

Press the F1 key to end the macro definition.

To save the macro in nonvolatile memory, enter the following command:

NVSAVE

Exit Setup (press the Setup key).

If you want to create a macro to move between a block cursor and an underline cursor, repeat the steps above defining the macro on a different key (perhaps the shifted version of the keypad's decimal point key).

To use these macros, just press the Setup key, then the defined key, and then the Setup key again.

LOCKING DEC USER-DEFINED FUNCTION KEYS

You can prevent reprogramming the keys while the keyboard performs DEC functions using `DECFUNCTIONKEYS`. All DEC user-defined function keys can be locked using this command.

- To lock the DEC function keys enter Setup (press the Setup key) and then enter the following command:

```
DECFUNCTIONKEYS LOCK
```

When locked, the DEC function keys cannot be reprogrammed while your keyboard performs DEC functions.

- To unlock the keys enter Setup (press the Setup key) and then enter the following command:

```
DECFUNCTIONKEYS UNLOCK
```

The keys can only be unlocked from the keyboard.

USING KEYMODE TO LOCK KEYS

The `KEYMODE` command affects the operation of the Tek key and the Compose Character key. With the `KEYMODE` command, you can lock the keyboard in Tek functionality or in VT200 functionality so that it is not affected by pressing the Tek key. One purpose of this command is to prevent someone from accidentally changing the keyboard functionality by pressing the Tek key. Although you cannot use the Tek key to toggle between Tek and VT200 functions when it is locked, the Tek key light continues to reflect the state of the keyboard.

The `KEYMODE` command also gives you the ability to disable the Compose Character key. This feature can be used to prevent the side-effects of unintentionally pressing the Compose Character key and thus causing the 4211 to interpret the next two entered keys as a Compose Character sequence.

If you press either the Tek key or the Compose Character key when it is locked, the keyboard bell will sound.

You can control the action of the Tek key and the Compose Character key by entering Setup and issuing the `KEYMODE` command. `KEYMODE` specifies each key and its associated action as a pair. The first number of each pair is the *key-number* and the second number is the *key-action*. The following examples show how to do this.

- To **lock** the Tek key and:

- Keep the current keyboard functionality, enter:

```
KEYMODE 1,1
```

- Set the keyboard to Tek functionality, enter:

```
KEYMODE 1,3
```

- Set the keyboard to VT200 functionality, enter:

```
KEYMODE 1,5
```

- To **unlock** the Tek key and:

- Keep the current keyboard functionality, enter:

```
KEYMODE 1,Ø
```

- Set the keyboard to Tek functionality, enter:

```
KEYMODE 1,2
```

- Set the keyboard to VT200 functionality, enter:

```
KEYMODE 1,4
```

- To **lock** the Compose Character key, enter:

```
KEYMODE 2,1
```

- To **unlock** the Compose Character key, enter:

```
KEYMODE 2,Ø
```

You can find out what action the keys are set for by using the STATUS command. For example, enter:

```
STATUS  KEYMODE
```

The 4211 will display the current settings. If KEYMODE is set to the factory default settings it will display:

```
KEYMODE..... 1 2 2 Ø
```

This means that the Tek key is unlocked and set for Tek keyboard functionality, and the Compose Character key is unlocked.

If your 4211 has the Coax option, you will notice that when you are in HOSTPORT COAX the Tek key light remains on; however, the keyboard uses its Coax definitions rather than Tek or VT200 definitions.

When you switch from HOSTPORT HO: to HOSTPORT COAX, the 4211 remembers the KEYMODE setting and goes back to it the next time you enter HOSTPORT HO:.

If you (or a program you're running) issue the KEYMODE command while the 4211 is in HOSTPORT COAX, it will process the command but won't execute it until you switch to HOSTPORT HO:.

ASSIGNING AN ANSWERBACK MESSAGE

The 4211 can store a password-like message that a host can verify before releasing restricted information. The message must be entered in Setup (it can't be sent from the host).

NOTE

Before assigning an answerback message to your 4211, consult your systems programmer.

To assign the message to your 4211, follow these steps.

1. Enter Setup (press the Setup key).
2. Enter the ANSWERBACK command, a beginning delimiter, the message, and an ending delimiter. For example:

```
ANSWERBACK /PASSWORD/
```

3. Now save this setting so the 4211 will retain the answerback string in its memory. Enter:

```
NVSAVE
```


4211 Operator

WORKING WITH HOST APPLICATIONS

This section deals with information you need for initializing your 4211 Graphics Netstation and using its capabilities in order to run host programs.

Use the following list to locate information in this section:

- If you need general information on running applications, look at "General Host Applications Information." The two topics covered in that discussion include "Selecting a Host Command Mode" and "Compatibility Hints for Older Applications."
- If you are working with an RS-232 host, see "Using Keyboard Features With Host Applications."
- If you are using one of the optional communications interfaces, the discussions under the heading starting "Using Coax or LAN Option With Host Applications" will be helpful.

GENERAL HOST APPLICATION INFORMATION

SELECTING A HOST COMMAND MODE

The host command mode tells the 4211 what syntax to expect in commands from the host. Most applications will automatically select the appropriate host command mode. However, if you need to change the host command mode, use the following procedure. The choices are:

TEK	For programs that use Tek syntax, typically graphics imaging applications.
VT52	For programs using VT52 style commands.
ANSI	For programs using ANSI Standard X3.64 syntax, typically text editors.
ANSI VT200	For application programs using ANSI Standard X3.64 and intended for VT200 terminals.

ANSI VT100 For applications programs using ANSI Standard X3.64 and intended for VT100 terminals.

ANSI MULTINATIONAL For programs using ANSI Standard X3.64 that expect the ASCII Multinational Character Set.

Follow these steps to set the 4211 to the proper mode:

1. Check with your computer center staff or your systems programmer to determine which host command mode you should use to communicate with your host application.
2. Put the 4211 in Setup (press the Setup key) and select the mode with the CODE command as in the following examples:
 - To select Tek mode, enter:
CODE TEK
 - To select ANSI mode, enter:
CODE ANSI
 - To select ANSI with a VT200 initialization, enter:
CODE ANSI VT200
 - To select ANSI with a VT100 initialization, enter:
CODE ANSI VT100
 - To select VT52 mode, enter:
CODE VT52

3. Remove the 4211 from Setup (press the Setup key).

When you request STATUS CODE, the 4211 will respond simply with CODE ANSI for each of the ANSI initializations.

COMPATIBILITY HINTS FOR OLDER APPLICATIONS

The 4211 will run most applications written for other Tektronix terminals.

If the application queries for terminal type but has not been modified to recognize the 4211, you can use the `TERMINAL` command to change how your 4211 reports terminal type. You can then use the `ASIZEGROUP` command to select the appropriate character size group for your application. To change terminal type and select the character size group, follow this procedure:

1. Put the 4211 in Setup (press the Setup key).
2. Enter the appropriate commands.
 - For example, to run a 4125 application, you would enter:

```
TERMINAL 4125
ASIZEGROUP 1
```

- To run a 4014 application, you would enter:

```
TERMINAL 4014
DAENABLE 0
ASIZEGROUP 2
```

- To run a 4111 application, you would enter:

```
TERMINAL 4111
ASIZEGROUP 0
```

Now, when queried by an application, the 4211 would report the entered terminal model, allowing you to run the application without modifying the program.

3. If you want to save this setting so that the 4211 is *always* able to run applications for this terminal type, issue this command:

```
NVSAVE
```

4. Remove the 4211 from Setup (press the Setup key again).

USING KEYBOARD FEATURES WITH HOST APPLICATIONS

SELECTING MULTINATIONAL KEYBOARD CHARACTER SETS

If you have a VT200-style keyboard, or a coax keyboard in either RS-232 or Telnet communications mode, you can select an ASCII multinational keyboard character set or a DEC multinational keyboard character set in addition to the standard ASCII national character set.

NOTE

*For more information about these character sets, refer to the **4210 Series Command Summary**.*

To select one of the multinational character sets, follow these steps:

1. Put your 4211 in Setup (press the Setup key).
 - To select ASCII Multinational Character Set, enter:

```
KBDCHARSET ASCIIMULTINATIONAL
```

- To select the DEC Multinational Character Set, enter:

```
KBDCHARSET DECMULTINATIONAL
```

2. If you want to save this setting so that the 4211 always powers up to this character set, enter:

```
NVSAVE
```

3. Remove the 4211 from Setup (press the Setup key again).

SELECTING CHARACTER SETS

The 4211 can display 21 different character sets, all of which are stored in the firmware. Thirteen character sets support national keyboards and eight character sets provide supplemental characters for special purposes, including support of specific makes and models of printers. Table 8-1, which shows how to select character sets, lists all 21.

Plugging a keyboard into the Graphics module automatically selects that keyboard's character set as the primary character set. For example, if you are using the North American keyboard, the 4211 displays the North American character set, and if you are using the German keyboard, the 4211 displays the German character set.

In Setup, your 4211 always displays the character set associated with your keyboard. The new character set is displayed when you exit Setup.

Use the Setup command `SELECTCHARSET` to select character sets. You can select a character set to be the *primary* (G0), *alternate* (G1), *first alternate* (G2), or *second alternate* (G3) set. Table 8-1 shows only the command entry required to select the *primary* (G0) and *alternate* (G1) sets.

For example, to select the Tek Supplemental character set as the alternate set, enter Setup and type:

```
SELECTCHARSET G1, 3
```

Once you select a character set other than the one that goes with your keyboard, you'll need to use the code charts to determine how to generate the new characters. (Refer to the *4210 Series Command Summary* for code charts and keyboard macros.) First, find the character on the code chart of the new character set and note the number in the lower right corner of the box; then go to the code chart for your keyboard, find the box with that number, and press the key that is labeled with that character.

For example, if you want the "omega" character (which is ADE 90) in the Supplementary character set, press the key that maps to ADE 90 (shifted "Z" keycap on any of the keyboards).

Remember, since Setup always uses the character set associated with your keyboard, you won't be able to see the new characters until you exit Setup and start work with your host.

Table 8-7
SETUP SYNTAX FOR THE SELECTCHARSET COMMAND

Character Set	To Assign as G0	To Assign as G1 ^a
North American (ASCII)	SELECTCHARSET G0,/B/	SELECTCHARSET G1,/B/
Danish/Norwegian	SELECTCHARSET G0,/I/	SELECTCHARSET G1,/I/
French	SELECTCHARSET G0,/f/	SELECTCHARSET G1,/f/
German	SELECTCHARSET G0,/K/	SELECTCHARSET G1,/K/
Greek	(none)	SELECTCHARSET G1,/F/
Italian	SELECTCHARSET G0,/Y/	SELECTCHARSET G1,/Y/
JIS Katakana	SELECTCHARSET G0,/I/	SELECTCHARSET G1,/I/
JIS Roman	SELECTCHARSET G0,/J/	SELECTCHARSET G1,/J/
Spanish	SELECTCHARSET G0,/Z/	SELECTCHARSET G1,/Z/
Swedish	SELECTCHARSET G0,/G/	SELECTCHARSET G1,/G/
Swedish Names	SELECTCHARSET G0,/H/	SELECTCHARSET G1,/H/
Swiss-German	SELECTCHARSET G0,/=/	SELECTCHARSET G1,/=/
United Kingdom	SELECTCHARSET G0,/A/	SELECTCHARSET G1,/A/
ASCII Supplemental ^c	(none)	SELECTCHARSET G1,/A/,96
DEC Rulings	SELECTCHARSET G0,/O/	SELECTCHARSET G1,/O/
DEC Supplemental	SELECTCHARSET G0,/</	SELECTCHARSET G1,/</
DEC Technical	SELECTCHARSET G0,/>/	SELECTCHARSET G1,/>/
Hewlett-Packard Supplemental	SELECTCHARSET G0,/ #1/	SELECTCHARSET G1,/ #1/
Tektronix Supplemental ^b	SELECTCHARSET G0,/3/	SELECTCHARSET G1,/3/
Tektronix 4696 Supplemental	(none)	SELECTCHARSET G1,/ #0/
Tektronix ColorQuick Supplemental	(none)	SELECTCHARSET G1,/ #2/

^aSelecting a character set as an alternate set requires you to use the ANSI SO (SHIFT OUT) command in host syntax. Consult the *4210 Series Programmers Manual* for a description of this command.

^bFormerly called Supplementary Character Set.

^cFormerly called Multilingual Character Set.

SWITCHING BETWEEN VT200 AND TEK FUNCTIONALITY

You can select VT200 or Tek keyboard functionality using the Tek key. When the Tek key light is on, the keyboard performs Tek functions.

When you select the Tek keyboard functionality, the keyboard includes the following features:

- Hold Screen, DCopy/SCopy, Setup, Menu, Break, SEras, GEras, DEras, Cancel, and Dialog are all preprogrammed function keys. F1 — F4, Help, Do, and F5-F8 are unprogrammed function keys; they may be programmed using macro commands as described in Section 7.
- The arrow keys can be used for both scrolling and graphics input.
- The Hold Screen key toggles the Hold Screen light on and off and signals the host to stop and resume sending information.
- The Compose key allows you to compose many combinations of characters (see "How To Compose Characters" later in this section).
- Several text editing keys located above the arrow keys are available for programming.
- The PF1 — PF4 keys are preprogrammed and also programmable using the Setup commands DEFINE, LEARN, NVLEARN, and NVDEFINE.

When you select VT200 keyboard functionality (the Tek key light is off), the keyboard includes these features:

- Hold Screen, Print Screen, Setup, Menu, Break keys are preprogrammed. The Dec function keys F6 — F14, Help, Do, F16 — F20 are programmable user-defined function keys. See "Locking DEC User-Defined Function Keys" in Section 7.
- The arrow keys work like the VT200 cursor movement arrow keys.
- Typical DEC text editing keys located above the arrow keys are provided.
- The Compose key allows you to compose many combinations of characters (see "How To Compose Characters" just ahead).
- The DECTERMINAL command allows you to select which DEC terminal type is reported to the host: VT100, VT101, VT102, VT220, or VT240.

NOTE

The KEYMODE command affects the operation of the Tek key. With the KEYMODE command, you can lock the keyboard in Tek functionality or in VT200 functionality so that it is not affected by pressing the Tek key. For more information, refer to "Using KEYMODE to Lock Keys" in Section 7.

DATA PROCESSING KEYS

Some applications require input of ASCII characters that may not be available in character sets other than North American.

To permit entry of the full ASCII character set from all keyboards, the non-ASCII national keyboards have one or more "data processing keys" (or "DP keys") with dual legends on them. The legend on the left is called the "typewriter legend," and the one on the right is called the "data processing legend." Keyboard Usage mode, which is controlled with the KEYUSEMODE command, controls which characters these dual-purpose keys send:

- When KEYUSEMODE is TYPEWRITER, the keyboard is in Typewriter Mode. Pressing on a DP key will transmit the character code associated with the Typewriter legend on that key.
- When KEYUSEMODE is DPROCESSING, the keyboard is in Data Processing Mode. Pressing a DP key will transmit the character code associated with the Data Processing legend on that key.

Note that the actual codes transmitted depend on the current keyboard character set — NATIONAL, ASCII MULTINATIONAL, or DEC MULTINATIONAL (see SKCS). If the character to be transmitted is not in the current keyboard character set, nothing will be sent.

NOTE

Keyboard Usage mode does not affect the macro numbers assigned to the DP keys.

Table 8-2 summarizes the character codes that are sent for each VT200-style international keyboard's DP keys in both Typewriter Mode and Keyboard Usage mode. Keyboards not summarized here are not affected by the state of KEYUSEMODE.

Table 8-2
KEYS AFFECTED BY
DATA PROCESSING KEYS MODE
(VT200-STYLE KEYBOARDS)

Danish/Norwegian Keyboard				
Mode	Key State	DP Keys		
		Å]	Ø \	Æ [
Typewriter	Normal	å	ø	æ
	Shift	Å	Ø	Æ
	Ctl	å	ø	æ
	Ctl-Shift	Å	Ø	Æ
Data Processing Keys	Normal	}	|	{
	Shift	}	|	{
	Ctl	g _s	f _s	e _c
	Ctl-Shift	g _s	f _s	e _c

French Keyboard				
Mode	Key State	DP Keys		
		6 \$ [	7 è]	% ù \
Typewriter	Normal	\$	è	ù
	Shift	6	7	%
	Ctl	r _s	u _s	ù
	Ctl-Shift	r _s	u _s	%
Data Processing Keys	Normal	[]	\
	Shift	6	7	%
	Ctl	e _c	o _s	f _s
	Ctl-Shift	e _c	o _s	f _s

German Keyboard			
Mode	Key State	DP Keys	
		Ü \ @	Ä []
Typewriter	Normal	ü	ä
	Shift	Ü	Ä
	Ctl	ü	ä
	Ctl-Shift	Ü	Ä
Data Processing Keys	Normal	@]
	Shift	\	[
	Ctl	n _u	o _s
	Ctl-Shift	f _s	e _c

(continued)

Table 8-2 (cont.)
KEYS AFFECTED BY
DATA PROCESSING KEYS MODE
(VT200-STYLE KEYBOARDS)

Italian Keyboard						
Mode	Key State	DP Keys				
		1 £ @	2 é #	9 ç [	0 á]	\$ \ *
Typewriter	Normal	£	é	ç	á	*
	Shift	1	2	9	0	\$
	Ctl	£	N _U	ç	á	*
	Ctl-Shift	1	N _U	9	0	\$
Data Processing Keys	Normal	@	#	[]	*
	Shift	1	2	9	0	\
	Ctl	N _U	N _U	E _C	G _S	F _S
	Ctl-Shift	N _U	N _U	E _C	G _S	F _S

Spanish Keyboard			
Mode	Key State	DP Keys	
		i \ ¿ @	ª [²]
Typewriter	Normal	¿	ª
	Shift	i	ª
	Ctl	¿	²
	Ctl-Shift	i	ª
Data Processing Keys	Normal	@]
	Shift	\	[
	Ctl	N _U	G _S
	Ctl-Shift	F _S	E _C

Swedish Keyboard					
Mode	Key State	DP Keys			
		\$ @ 3	¤ \$ 4	Å []	Ö \ #
Typewriter	Normal	3	4	Å	Ö
	Shift	\$	¤	Å	Ö
	Ctl	E _C	F _S	Å	Ö
	Ctl-Shift	E _C	F _S	Å	Ö
Data Processing Keys	Normal	3	4]	#
	Shift	@	\$	[\
	Ctl	N _U	F _S	G _S	F _S
	Ctl-Shift	N _U	F _S	E _C	F _S

(continued)

Table 8-2 (cont.)
KEYS AFFECTED BY
DATA PROCESSING KEYS MODE
(VT200-STYLE KEYBOARDS)

Swiss/German Keyboard						
Mode	Key State	DP Keys				
		ç @ 4	è \ ü	é [ö	à] ä	£ # \$
Typewriter	Normal	4	ü	ö	ä	\$
	Shift	ç	è	é	à	£
	Ctl	F _S	ü	ö	ä	\$
	Ctl-Shift	F _S	è	é	à	£
Data Processing Keys	Normal	4	ü	ö	ä	\$
	Shift	@	\	[]	#
	Ctl	N _U	F _S	E _C	G _S	\$
	Ctl-Shift	N _U	F _S	E _C	G _S	#

United Kingdom Keyboard		
Mode	Key State	DP Key £ # 3
Typewriter	Normal	3
	Shift	£
	Ctl	E _C
	Ctl-Shift	E _C
Data Processing Keys	Normal	3
	Shift	#
	Ctl	E _C
	Ctl-Shift	E _C

Table 8-3 summarizes the character codes that are sent for each Coax-option international keyboard's DP keys in both Typewriter Mode and Data Processing Keys mode. Keyboards not summarized here are not affected by either the state of KEYUSEMODE.

Table 8-3
KEYS AFFECTED BY
DATA PROCESSING KEYS MODE
(COAX OPTION KEYBOARDS)

Danish/Norwegian Keyboard				
Mode	Key State	DP Keys		
		Å]	Ø \	Æ [
Typewriter	Normal	å	ø	æ
	Shift	Å	Ø	Æ
	Ctl	å	ø	æ
	Ctl-Shift	Å	Ø	Æ
Data Processing Keys	Normal	}	|	{
	Shift	}	\	[
	Ctl	G _S	F _S	E _C
	Ctl-Shift	G _S	F _S	E _C

French Keyboard				
Mode	Key State	DP Keys		
		6 \$ [	7 è]	% ù \
Typewriter	Normal	\$	è	ù
	Shift	6	7	%
	Ctl	R _S	U _S	ù
	Ctl-Shift	R _S	U _S	%
Data Processing Keys	Normal	[]	\
	Shift	6	7	%
	Ctl	E _C	G _S	F _S
	Ctl-Shift	E _C	G _S	F _S

German Keyboard			
Mode	Key State	DP Keys	
		Ü \	Ä [
Typewriter	Normal	ü	ä
	Shift	Ü	Ä
	Ctl	ü	ä
	Ctl-Shift	Ü	Ä
Data Processing Keys	Normal	@]
	Shift	\	[
	Ctl	N _U	G _S
	Ctl-Shift	F _S	E _C

(continued)

Table 8-3 (cont.)
KEYS AFFECTED BY
DATA PROCESSING KEYS MODE
(COAX OPTION KEYBOARDS)

Italian Keyboard						
Mode	Key State	DP Keys				
		£ @ 3	# è	[ò	° à \	\$] ù
Typewriter	Normal	3	è	ò	à	ù
	Shift	£	é	ç	°	\$
	Ctl	E _C	è	ò	à	ù
	Ctl-Shift	E _C	é	ç	°	\$
Data Processing Keys	Normal	3	è	ò	\	ù
	Shift	@	#	[°]
	Ctl	N _U	è	E _C	F _S	G _S
	Ctl-Shift	N _U	#	E _C	F _S	G _S

Swedish Keyboard					
Mode	Key State	DP Keys			
		\$ @ 3	¤ \$ 4	Å [^ \
Typewriter	Normal	3	4	å	ü
	Shift	\$	¤	Å	^
	Ctl	E _C	F _S	å	ü
	Ctl-Shift	E _C	F _S	Å	^
Data Processing Keys	Normal	3	4]	#
	Shift	@	\$	[\
	Ctl	N _U	F _S	G _S	F _S
	Ctl-Shift	N _U	F _S	E _C	F _S

HOW TO COMPOSE CHARACTERS

Character Composition allows you to create characters that are available, but that are not shown on the keyboard since they require diacritical marks such as the ¢ sign. For example, to compose the ¢ sign, press the Compose Character key, c, and /. During a compose sequence, the Compose light turns on.

Characters can be composed in two ways.

- Use the Compose key and the two composing characters (3-Character Sequence)
- Use a diacritical mark and an additional character (2-Character Sequence)

Diacritical marks are not available on the North American keyboard; they are part of the foreign language keyboards. Generally, diacritical marks are available for the ASCII MULTINATIONAL and DEC MULTINATIONAL keyboard character sets. (For more information, see "Selecting Character Sets" in this section, or refer to the *4210 Series Programmers Manual*.)

Table 8-4 lists the diacritical marks.

Table 8-4
DIACRITICAL MARKS

Keyboard	Keyboard Character Set (SKCS)	
	National	DEC Multinational or ASCII Multinational
Danish/Norwegian	none	ˆ ˇ ˘ ˙ ˚
French	none	ˆ ˇ ˘ ˙ ˚
German	none	ˆ ˇ ˘ ˙ ˚
Italian	ˆ	ˆ ˇ ˘ ˙ ˚
Katakana	none	none
North American	none	none
Spanish	none	ˆ ˇ ˘ ˙ ˚
Swedish	none	ˆ ˇ ˘ ˙ ˚
Swiss-German	ˆ ˆ	ˆ ˇ ˘ ˙ ˚
United Kingdom	none	ˆ

Two ˆ symbols appear on the keyboard. The one on the top row of keys is a diacritical mark and can be thought of as an acute accent (ˆ), even though the compose sequence generates a single quote. The other one is not a diacritical mark and can be thought of as an apostrophe (').

Table 8-5 (next page) lists the characters that can be composed and the characters needed to create them. When using the compose key to create a character (3-Character Sequence), the sequence of the keypresses is not critical, except where noted. When composing characters using diacritical marks (2-Character Sequence), press the keys in the sequence shown in the table.

To compose a character with the Compose key:

1. Press the Compose key. The Compose indicator light turns on.
2. Press the first character in the composed character.
3. Press the second character in the composed character.
4. The composed character appears and the Compose indicator light turns off.

To compose a character with a diacritical mark:

1. Press the diacritical mark. The Compose indicator turns on.
2. Press the second character in the composed character.
3. The composed character appears and the Compose indicator light turns off.

If you try to compose a character that is not valid for the character set, the keyboard bell sounds and an error message appears on the screen.

A composition can be canceled several ways.

- Press the Compose key to cancel the current composition and start another composition.
- Press any function key, numeric keypad key, text editing key, the Tek key, the mouse or thumbwheels buttons, or any arrow key to cancel the composition and initiate the function of the key you pressed.
- Press the Del key to cancel the composition and not perform any other function.

NOTE

The KEYMODE command affects the operation of the Compose Character key. You can use the KEYMODE command to disable the Compose Character key and thus prevent someone from unintentionally creating a Compose Character sequence. For more information, refer to "Using KEYMODE to Lock Keys" in Section 7.

Table 8-5
COMPOSE SEQUENCES FOR SPECIAL CHARACTERS

Char- acter	Description	Compose Sequence		Character Code (by Keyboard Character Set)											
				Multinational		National (for these keyboards ^c)									
		Three-Key ^a	Two-Key ^b	ASCII	DEC	NA	DN	Fr	Ge	It	SG	Sp	Sw	UK	
[	Left bracket	((✓	✓	✓								✓	
\	Backslash	//		✓	✓	✓								✓	
		/ <		✓	✓	✓								✓	
]	Right bracket))		✓	✓	✓								✓	
{	Left brace	(-		✓	✓	✓								✓	
|	Vertical bar	^ /	^ /	✓	✓	✓								✓	
}	Right brace) -		✓	✓	✓								✓	
#	Pound sign	+ +		✓	✓		✓		✓				✓		
^	Circumflex	^ s _p	^ s _p	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
~	Tilde	~ s _p	~ s _p	✓	✓	✓								✓	
		~ s _p		✓											
@	Commercial At sign	A A		✓	✓	✓								✓	
		a a		✓	✓	✓								✓	
\$	Dollar sign	S /		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
		s /		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
		S |		✓	✓	✓								✓	
		s |		✓	✓	✓								✓	
'	Apostrophe	' s _p	' s _p	✓											
"	Quotation mark	" s _p			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		" s _p	" s _p					✓							
á	Small a with acute accent	' a	' a	✓	✓										
Á	Capital A with acute accent	' A	' A	✓	✓										
à	Small a with grave accent	` a	` a	✓	✓						✓				
À	Capital A with grave accent	` A	` A	✓	✓										
â	Small a with circumflex	^ a	^ a	✓	✓										
Â	Capital A with circumflex	^ A	^ A	✓	✓										
ä	Small a with umlaut	a "		✓	✓				✓		✓		✓		
		" a	" a	✓											
Ä	Capital A with umlaut	A "		✓	✓				✓				✓		
		" A	" A	✓											
ã	Small a with tilde	~ a	~ a	✓	✓										
		a ~		✓											
Ã	Capital A with tilde	~ A	~ A	✓	✓										
		A ~		✓											
ä	Small a with ring	a *		✓	✓		✓						✓		
		° a		✓	✓										

^a To compose a character with a three-key sequence, press ComposeCharacter followed by the two keys shown in this column.

^b Two-key compose sequences are only available on national keyboards that support the requisite diacritical marks.

^c Keyboard nationalities are abbreviated as follows: NA = North American; DN = Danish/Norwegian; Fr = French; Ge = German; It = Italian; SG = Swiss/German; Sp = Spanish; Sw = Swedish; UK = United Kingdom.

(continued)

Table 8-5 (cont.)
COMPOSE SEQUENCES FOR SPECIAL CHARACTERS

Char- acter	Description	Compose Sequence		Character Code (by Keyboard Character Set)											
				Multinational		National <i>(for these keyboards^c)</i>									
		Three-Key ^a	Two-Key ^b	ASCII	DEC	NA	DN	Fr	Ge	It	SG	Sp	Sw	UK	
À	Capital A with ring	A *		✓	✓		✓						✓		
		° A		✓	✓										
æ	Small ae ligature	a e		✓	✓		✓								
Æ	Capital AE ligature	A E		✓	✓		✓								
ç	small c with cedilla	c ,		✓	✓			✓		✓	✓	✓			
Ç	Capital C with cedilla	C ,		✓	✓										
Ð	Capital Icelandic Eth	D -		✓											
ð	Small Icelandic eth	d -		✓											
é	Small e with acute accent	´e	´e	✓	✓			✓		✓	✓				
É	Capital E with acute accent	´E	´E	✓	✓										
è	Small e with grave accent	`e	`e	✓	✓			✓		✓	✓				
È	Capital E with grave accent	`E	`E	✓	✓										
ê	small e with circumflex	^e	^e	✓	✓						✓				
Ê	Capital E with circumflex	^E	^E	✓	✓										
ë	Small e with diaeresis	e"		✓	✓										
		"e	"e	✓											
Ë	Capital E with diaeresis	E"		✓	✓										
		"E	"E	✓											
í	Small I with acute accent	´i	´i	✓	✓										
Í	Capital I with acute accent	´I	´I	✓	✓										
ì	Small i with grave accent	`i	`i	✓	✓					✓					
Ì	Capital I with grave accent	`I	`I	✓	✓										
î	Small i with circumflex	^i	^i	✓	✓						✓				
Î	Capital I with circumflex	^I	^I	✓	✓										
ï	Small i with diaeresis	i"		✓	✓										
		"i	"i	✓											
Ï	Capital I with diaeresis	I"		✓	✓										
		"I	"I	✓											
ñ	Small n with tilde	~n	~n	✓	✓							✓			
		n~		✓											
Ñ	Capital N with tilde	~N	~N	✓	✓							✓			
		N~		✓											
ó	Small o with acute accent	´o	´o	✓	✓										
Ó	Capital O with acute accent	´O	´O	✓	✓										

^aTo compose a character with a three-key sequence, press ComposeCharacter followed by the two keys shown in this column.

^bTwo-key compose sequences are only available on national keyboards that support the requisite diacritical marks.

^cKeyboard nationalities are abbreviated as follows: NA = North American; DN = Danish/Norwegian; Fr = French; Ge = German; It = Italian; SG = Swiss/German; Sp = Spanish; Sw = Swedish; UK = United Kingdom.

(continued)

Table 8-5 (cont.)
COMPOSE SEQUENCES FOR SPECIAL CHARACTERS

Character	Description	Compose Sequence		Character Code (by Keyboard Character Set)												
		Three-Key ^a	Two-Key ^b	Multinational		National (for these keyboards ^c)										
				ASCII	DEC	NA	DN	Fr	Ge	It	SG	Sp	Sw	UK		
ò	Small o with grave accent	`o	`o	✓	✓								✓			
Ö	Capital O with grave accent	`O	`O	✓	✓											
ô	Small o with circumflex	^o	^o	✓	✓											
Ö	Capital O with circumflex	^O	^O	✓	✓											
ö	Small o with umlaut	o"		✓	✓				✓		✓		✓			
		"o	"o	✓												
Ö	Capital O with umlaut	O"		✓	✓				✓				✓			
		"O	"O	✓												
õ	Small o with tilde	~o	~o	✓	✓											
		o~		✓												
Õ	Capital O with tilde	~O	~O	✓	✓											
		O~		✓												
œ	Small oe ligature	o e			✓											
Œ	Capital OE ligature	O E			✓											
ø	small o with slash	o /		✓	✓			✓								
Ø	Capital O with slash	O /		✓	✓			✓								
ß	Small German sharp s	s s		✓	✓					✓						
þ	Small Icelandic thorn	p p		✓												
Þ	Capital Icelandic Thorn	P P		✓												
ú	Small u with acute accent	`u	`u	✓	✓											
Ú	Capital U with acute accent	`U	`U	✓	✓											
ù	Small u with grave accent	`u	`u	✓	✓			✓		✓	✓					
Û	Capital U with grave accent	`U	`U	✓	✓											
û	Small u with circumflex	^u	^u	✓	✓											
Û	Capital U with circumflex	^U	^U	✓	✓											
ü	Small u with umlaut	u"		✓	✓				✓		✓		✓			
		"u	"u	✓												
Ü	Capital U with umlaut	U"		✓	✓				✓				✓			
		"U	"U	✓												
ý	Small y with acute accent	`y	`y	✓												
Ý	Capital Y with acute accent	`Y	`Y	✓												
ÿ	Small y with diaeresis	y"		✓	✓											
		"y	"y	✓	✓											

^aTo compose a character with a three-key sequence, press ComposeCharacter followed by the two keys shown in this column.

^bTwo-key compose sequences are only available on national keyboards that support the requisite diacritical marks.

^cKeyboard nationalities are abbreviated as follows: NA = North American; DN = Danish/Norwegian; Fr = French; Ge = German; It = Italian; SG = Swiss/German; Sp = Spanish; Sw = Swedish; UK = United Kingdom.

(continued)

Table 8-5 (cont.)
COMPOSE SEQUENCES FOR SPECIAL CHARACTERS

Character	Description	Compose Sequence		Character Code (by Keyboard Character Set)												
				Multinational		National (for these keyboards ^c)										
		Three-Key ^a	Two-Key ^b	ASCII	DEC	NA	DN	Fr	Ge	It	SG	Sp	Sw	UK		
ÿ	Capital Y with diaeresis	Y "			√											
	No-break space	s _p s _p		√												
¼	Fraction one-fourth	1 4	√													
½	Fraction one-half	1 2		√	√											
¾	Fraction three-fourths	3 4		√												
¹	Superscript 1	^ 1	^ 1	√	√											
²	Superscript 2	^ 2	^ 2	√	√											
³	Superscript 3	^ 3	^ 3	√	√											
±	Plus-or-minus sign	+ -		√	√											
÷	Division sign	- :		√												
×	Multiplication sign	X X		√												
		x x		√												
¤	Currency sign	X 0		√	√						√					
		X O		√	√						√					
		x 0		√	√						√					
		x o		√	√						√					
£	Pounds currency sign	L -		√	√					√				√		
		L =		√	√					√				√		
		l -		√	√					√				√		
		l =		√	√					√				√		
¢	Cent sign	C /		√	√											
		C |		√	√											
		c /		√	√											
		c |		√	√											
¥	Yen sign	Y -		√	√											
		Y =		√	√											
		y -		√	√											
		y =		√	√											
'	Acute accent	' 'd	' 'd	√												
		' 'd	' 'd	√												
¨	Diaeresis or umlaut	" s _p		√												
		" s _p	" s _p	√												
¯	Macron or overbar	—		√			√			√						

^a To compose a character with a three-key sequence, press ComposeCharacter followed by the two keys shown in this column.

^b Two-key compose sequences are only available on national keyboards that support the requisite diacritical marks.

^c Keyboard nationalities are abbreviated as follows: NA = North American; DN = Danish/Norwegian; Fr = French; Ge = German; It = Italian; SG = Swiss/German; Sp = Spanish; Sw = Swedish; UK = United Kingdom.

^d You can use either two apostrophes (' ' — available on all keyboards) or two acute accents (' ' — available only on the German and Danish/Norwegian keyboards) to compose an acute accent.

(continued)

Table 8-5 (cont.)
COMPOSE SEQUENCES FOR SPECIAL CHARACTERS

Character	Description	Compose Sequence		Character Code (by Keyboard Character Set)										
		Three-Key ^a	Two-Key ^b	Multinational		National (for these keyboards ^c)								
				ASCII	DEC	NA	DN	Fr	Ge	It	SG	Sp	Sw	UK
¸	Cedilla	¸ ¸		✓										
-	Soft hyphen	- -		✓										
µ	Small mu or micro sign	/ U [*]		✓	✓			✓						
		/ u [*]		✓	✓			✓						
°	Degree sign	^ 0	^ 0	✓	✓			✓		✓		✓		
		s _p *		✓	✓			✓		✓		✓		
		s _p °		✓	✓			✓		✓				
º	Masculine ordinal indicator	O _		✓	✓									
		o _		✓	✓									
ª	Feminine ordinal indicator	A _		✓	✓									
		a _		✓	✓									
§	Section sign	S 0		✓	✓			✓	✓	✓				
		s 0		✓	✓			✓	✓	✓				
		S O		✓	✓			✓	✓	✓				
		s o		✓	✓			✓	✓	✓				
¶	Paragraph or pilcrow	P !		✓	✓									
		p !		✓	✓									
.	Centered dot	^ .	^ .	✓	✓									
©	Copyright sign	C 0		✓	✓									
		c 0		✓	✓									
		C O		✓	✓									
		c o		✓	✓									
®	Registered sign	R 0		✓										
		r 0		✓										
		R O		✓										
		r o		✓										
¡	Inverted exclamation mark	! !		✓	✓							✓		
¿	Inverted question mark	? ?		✓	✓							✓		
«	Angle quotation mark left	< <		✓	✓									
»	Angle quotation mark right	> >		✓	✓									
|	Broken vertical bar	! =		✓										
¬	Not sign	- !		✓										

^aTo compose a character with a three-key sequence, press ComposeCharacter followed by the two keys shown in this column.

^bTwo-key compose sequences are only available on national keyboards that support the requisite diacritical marks.

^cKeyboard nationalities are abbreviated as follows: NA = North American; DN = Danish/Norwegian; Fr = French; Ge = German; It = Italian; SG = Swiss/German; Sp = Spanish; Sw = Swedish; UK = United Kingdom.

USING COAX OR LAN OPTION WITH HOST APPLICATIONS

After host communications have been set up, your 4211 could communicate through the RS-232-C port, or through the optional coax or LAN ports. The following topics discuss host port operating differences, switching between hosts, switching between coax DFT sessions, and using the Telnet interface.

COAX OPERATING DIFFERENCES

Once you configure the Coax option, the 4211 automatically selects its host port connection according to the nonvolatile setting of the HOSTPORT command each time you power up or reset the 4211. The format of the display will reflect the host port to which the 4211 is logically connected. (Any other information on the display is dependent on the host system.)

HOSTPORT HO: includes RS-232-C and optionally LAN communications, both discussed earlier in this manual. If you have the LAN option, the DMAP command toggles HO: between RS-232-C communications and LAN communications.

If you have the LAN option as well as the Coax option, the DMAP command is available and you can select communications through the HO: logical device.

HOSTPORT COAX Communications Stop/Start-Up

The following processes take place when your 4211 enters coax communications (HOSTPORT COAX):

- The 4211 selects the BNC coax connector (COMM), located on the rear panel, for communication with the host computer. The 4211 will now communicate with the IBM host over the coax cable via the IBM 3274 or 3174 Control Unit.
- The keyboard emulates the IBM enhanced style keyboard. The alphanumeric keys take on their EBCDIC meanings. All IBM function keys take on their IBM meanings. The arrow keys take on the definitions of IBM arrow keys, and keys F1 through F8 serve as additional function keys. Other Tektronix function keys operate according to their labels. All keys can be used as programmable function keys on the VT200 keyboard only. The arrow keys can be used to control a cursor for graphics input (GIN). Most keys can be programmed to give them other functions.
- The display screen's dialog area is set to 32 visible lines, with an additional two-line operator information area (separated from the dialog area by a blue line) displayed at the bottom of the screen. This area provides status information about the current operation in the form of status symbols, either singly or in combination. A table that lists all of the displayed status symbols and their meaning is provided in Appendix F.
- When you enter Setup, the Tek dialog area is made visible and the Setup prompt (*) is displayed. When you leave Setup, the screen displays the dialog that was displayed before you put the 4211 in Setup.

HOSTPORT HO: Communications Stop/Start-Up

The following processes take place when a 4211 with the Coax option enters HO: communications (RS-232-C communications, unless the LAN option is installed).

- The 4211 selects the COMPUTER port, located on the rear panel, for communications with the host computer.
- The 4211 keys assume their ASCII meanings, and any macros that are defined can be used (unless the key macros are disabled with the KEYEXPAND command). Function Keys F1 through F8 assume their RS-232 functions, as do the arrow keys. The IBM function keys serve as additional programmable function keys for RS-232-C applications.

The 4211 continues to respond to the IBM 3274 or 3276 Control Unit so that it can recognize that the 4211 is connected. This allows you to switch back to the HOSTPORT COAX connection without executing a RESET command or losing the connection. When the 4211 is connected to HOSTPORT HO:, data coming in from the IBM host is queued and does not interfere with the current screen display.

If you have the LAN option, the DMAP command toggles HO: between RS-232-C communications and LAN communications, so selecting HOSTPORT HO: gives you either RS-232-C or LAN communications, depending on the DMAP setting.

LAN OPERATING DIFFERENCES

Once you configure your 4211, it automatically selects its host port connection according to the nonvolatile setting of the DMAP command each time you power up or reset the 4211. The format of the display will reflect the host port to which the 4211 is logically connected. (Any other information on the display is dependent on the host system.)

If you have the Coax option, the HOSTPORT command is available and you can select communications through the coax port.

RS-232-C Communications Stop/Start-Up

The following processes take place when a 4211 with the LAN option enters RS-232-C communications (DMAP HO:,SP0).

- The 4211 selects the COMPUTER port, located on the rear panel, for communications with the host computer.
- The 4211 keys assume their ASCII meanings, and any macros that are defined can be used (unless the key macros are disabled with the KEYEXPAND command). Function Keys F1 through F8 assume their RS-232 functions, as do the arrow keys. The IBM function keys serve as additional programmable function keys for RS-232-C applications.

LAN Communications Stop/Start-Up

The following processes take place when your 4211 enters LAN communications (DMAP HO:,NTN):

- The 4211 selects the LAN port, located on the rear panel, for communications through the Telnet interface with a variety of host computers and terminals.
- The 4211 keys assume their ASCII meanings, and any macros that are defined can be used (unless the key macros are disabled with the KEYEXPAND command). Function Keys F1 through F8 assume their RS-232 functions, as do the arrow keys. The IBM function keys serve as additional programmable function keys for RS-232-C applications.

If you also have the Coax option, the 4211 continues to respond to the IBM 3274 or 3276 Control Unit so that it can recognize that the 4211 is connected. This allows you to switch back to the HOSTPORT COAX connection without executing a RESET command or losing the connection. When the 4211 is connected to HOSTPORT TELNET, data coming in from the IBM host is queued and does not interfere with the current screen display.

SWITCHING BETWEEN HOSTS

A 4211 with the Coax option can be connected to a coax (IBM) host, an RS-232-C host, and a LAN host through the COMM, COMPUTER, and LAN ports. While you can be logged on to all hosts simultaneously, the screen can display information from only one host at a time.

If you have the Coax or LAN option, you can easily switch ports using either of the following methods:

1. Use the HOSTPORT command.

- For example, if you want to switch to coax communications, press the Setup key and then enter:

```
HOSTPORT COAX
```

- To switch from coax to LAN, enter:

```
DMAP HO: NTN  
HOSTPORT HO:
```

- To switch from LAN to coax, enter:

```
HOSTPORT COAX
```

- To switch from coax to RS-232, enter:

```
DMAP HO: SPØ  
HOSTPORT HO:
```

Press the Setup key again. Your 4211 can now display information from whichever host you specified.

2. If you have the coax keyboard, use the Shift-Jump key combination — just hold down the Shift key while pressing the Jump key. This method will toggle you between coax and the host which has been specified in the DMAP HO: command.

When you switch connection to one host port or the other, the keyboard functions immediately change to match the needs of the corresponding host system. (See the Appendix A for a description of how selecting a host port changes the keyboard's operation.)

SWITCHING BETWEEN COAX DFT SESSIONS

The 4211 can be configured for DFT mode, which allows you to specify up to five sessions. (A session is an independent connection between the 4211 and an IBM host.) Section 4 shows you how to configure the 4211 for DFT mode and multiple sessions.

Once the 4211 is configured for multiple sessions, use the Jump key on the coax keyboard to cycle you through to each session. The five sessions are denoted by the letters A through E.

For example:

- If you are in SESSION A and want to jump to SESSION B, press the Jump key once.
- If you are in SESSION B and want to jump to SESSION D, press the Jump key twice.
- If you are in SESSION D and want to jump to SESSION B, press the Jump key three times.

The current session is shown in the operator information area after the word SESSION.

NOTE

Once you begin a graphics application, the Jump key is disabled. You cannot switch to another session until you exit the current graphics application, which frees the Jump key and allows you to switch sessions.

WORKING WITH THE TELNET INTERFACE

Once you have established a connection with Telnet, the host will respond with a login prompt if you are in Local mode. (See Section 4, *Communicating With a Host Computer*, for procedures on setting up Telnet connection.)

After you have entered the escape character and are in Local mode, a help menu is provided so you can easily see a list of the commands and their current value. To access the help menu, enter the HELP command, or press the ? at the Telnet prompt.

Following is a list of the commands:

- OPEN *host-name* — Opens a connection to the named host.
- ESCAPE — Prompts you to set the escape character.
- PASSTHRU — Sends the escape character (to set the 4211 back to local use, you can also use the TLOCAL command in Setup mode).
- INTERRUPT — Interrupts the process.
- CLOSE — Closes the current Telnet session and returns to command mode.
- VIEW — Toggles viewing of Telnet options (echo and binary) processing. Options sent by Telnet are displayed as SENT, while options received from the Telnet server are displayed as RCVD.
- AYT — Asks the host if connection is made. Response to a connection is a bell.
- STATUS — Displays the current status of Telnet.
- HELP or ? — Displays help information.
- BINARY — Toggles between ASCII and binary transmission modes. (You can also use ASCII in Setup to access ASCII mode, and BINARY in Setup to access binary mode.)
- ECHO — Sends the echo option request.
- CRNU — Sends the CR followed by a NU.
- CRLF — Sends the CR followed by a LF.

When you are in command mode, you can do line editing with the EDITCHARS command. See the *4210 Series Command Summary* for more information on using the EDITCHARS command.

If you have the Coax option, you can exit Telnet from Setup by entering the following:

```
HOSTPORT COAX
```

If you want to exit Telnet and enter RS-232-C communications, enter the following:

```
DMAP HO:SPØ
```

Setup Commands In the Telnet Protocol

You can use the following Telnet commands from Setup only. Table 8-6 lists the commands and the corresponding descriptions and defaults. The settings return to the default after you exit Telnet.

Table 8-6
TELNET COMMANDS

Command	Description	Default
TESCAPE	Sets the Telnet "escape to local" character to the ASCII equivalent value of the parameter	Ctrl-]
TDATA	Selects the type of data the Telnet connection will use. ASCII or BINARY	ASCII
TLOCAL	Sets the Telnet connection to local Telnet server	
TPASSTHRU	Sets the Telnet passthru mode	OFF
TCR	Specifies the Network Virtual Terminal end of the line character	CRNU

CONTROLS, KEYS, AND CONNECTORS

This appendix describes the external controls and connectors on the Display module, Graphics module, and keyboard. It also shows the keyboard layout and discusses the function of the keys.

Use the following list to locate information you need in this section:

- To view the Display module or Graphics module controls and connectors, look at the topics "Display Module" or "Graphics Module."
- To find information on the VT200-style keyboard layout and function keys, see "VT200 Style Keyboard."
- For coax keyboard layout and function keys information, see "Coax Keyboard."

DISPLAY MODULE

Figure A-1 shows the location of the front panel controls and connectors on the Display module. They are:

- **POWER switch** — Turns the Display module on or off.

- **CONTRAST control** — Adjusts the picture contrast.
- **BRIGHTNESS control** — Adjusts the picture brightness
- **POWER indicator** — Indicates with light that power is on.
- **X axis¹** — Fine tunes the red and blue vertical lines so that they converge with the green vertical line (normally in center *detent* position, so when you adjust the X axis, you will feel a mechanical click at detent).
- **Y axis¹** — Fine tunes the red and blue horizontal lines so that they converge with the green horizontal line (normally in center *detent* position, so when you adjust the Y axis, you will feel a mechanical click at detent).
- **Z axis¹** — Fine tunes the color purity and brightness uniformity (normally in center *detent* position, so when you adjust the Z axis, you will feel a mechanical click at detent).
- **DEGAUSS** — Degausses the display's shadow mask. Operates automatically when power is turned on. Press for manual use when coloring of the display is uneven.

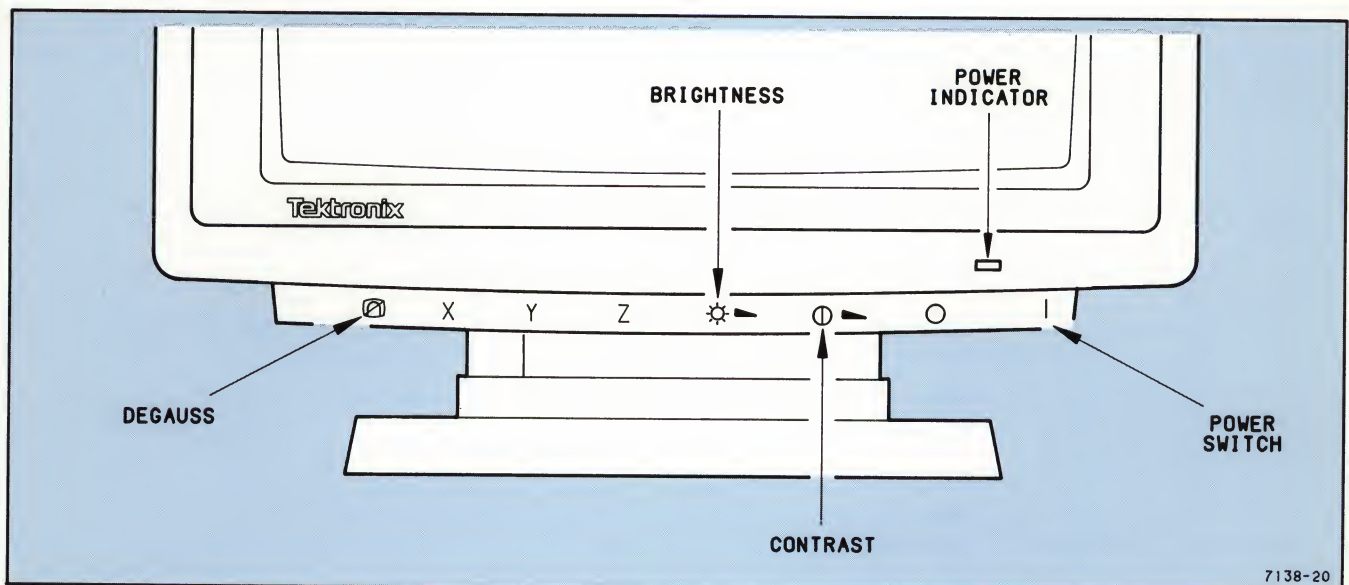


Figure A-1. Display Module Front Controls and Connectors.

1. This control is not present on later-model displays.

Controls, Keys, and Connectors

Figure A-2 shows the location of the Display module's rear panel connectors. They are:

- AC IN connector — Accepts AC power for the display.
- VIDEO IN/OUT connectors (BNC) — Accept RGB video signals. Send RGB video signals.

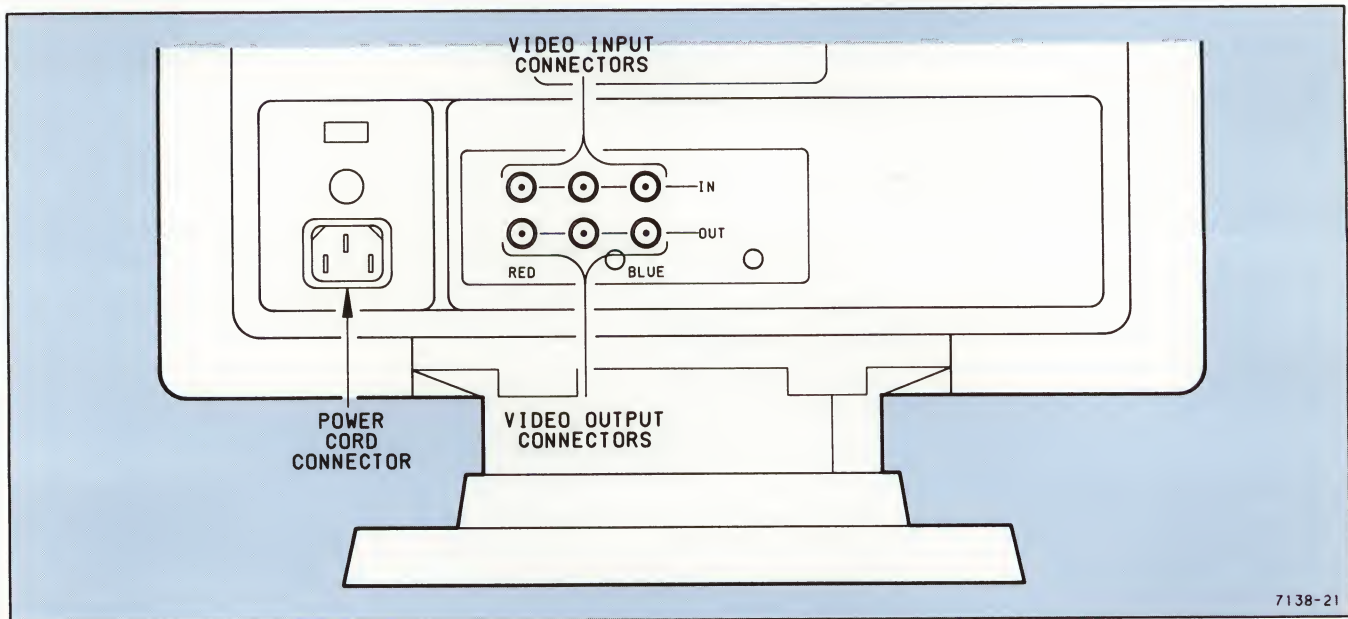


Figure A-2. Display Module Rear Connectors.

GRAPHICS MODULE

Connectors on the rear of the Graphics module include:

- VIDEO connector — Provides red, green, and blue signals to the Display module.
- KEYBOARD connector — Provides connection to the keyboard.
- COMPUTER port — Provides RS-232 connection to a host computer.
- PORT 0 and PORT 1 — Provides standard RS-232 signals to peripheral devices.
- COPIER port — Provides a Centronics-style interface to (1) Tektronix 4690 Series Copiers, (2) some monochrome printers.
- LAN connector — Provides a port to a Local Area Network.
- VOLTAGE SELECTOR switch — Sets the 4211's operating line voltage.
- AC IN connector — Accepts power for the Graphics module.
- ROM board slot — Accepts ROM board.
- COAX connector — Provides coaxial cable connection to an IBM 3274 or 3174 Control Unit for connection to an IBM host computer.

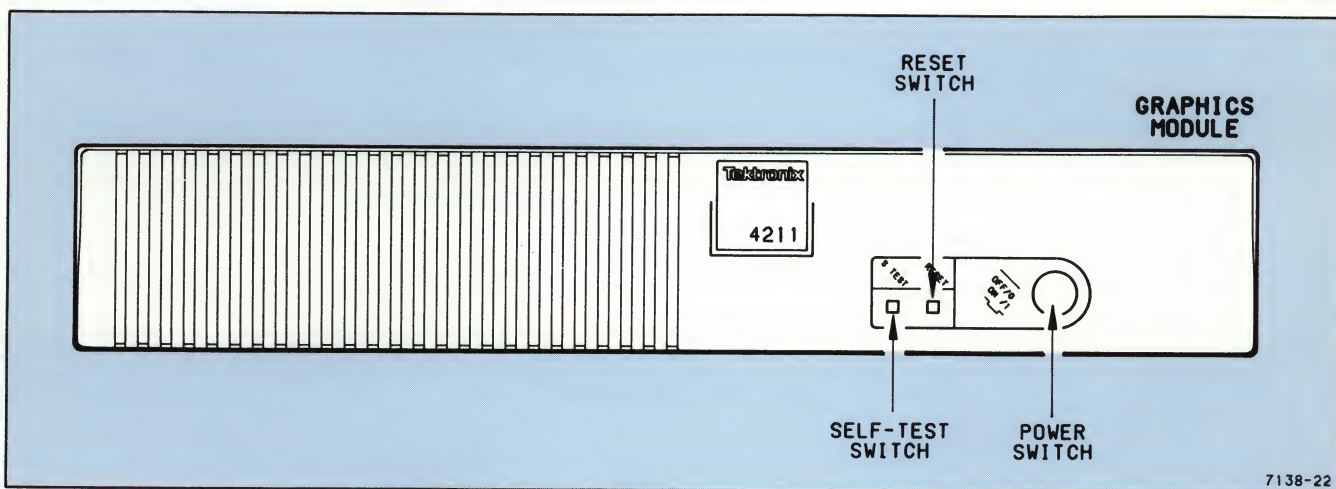


Figure A-3. Graphics Module Front Controls and Connectors.

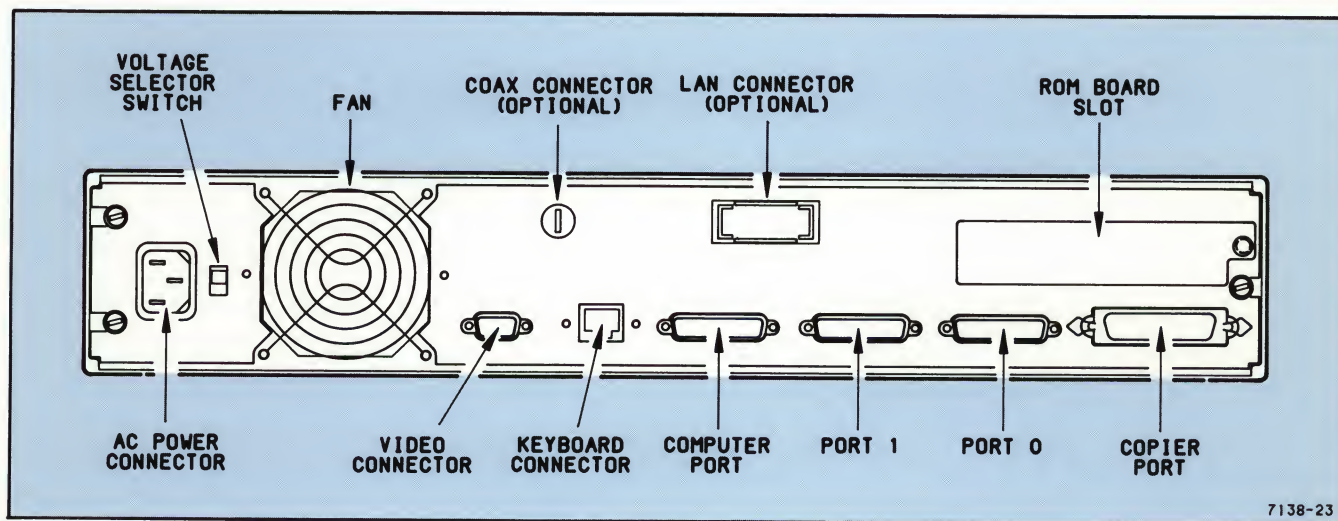


Figure A-4. Graphics Module Rear Controls and Connectors.

VT200 STYLE KEYBOARD

The VT200 style keyboard includes:

- ASCII Keys — Standard alphanumeric keys
- Tek special function keys
- 18 keys for numeric entry and program functions
- Indicator lights
- Arrow keys for cursor control and graphics input

- Connectors for an optional mouse or thumbwheels
- A Tek key, which toggles between Tek and VT200 keyboard functionality
- VT200-style keys

Figure A-5 shows the VT200 style keyboard and highlights the various keys and key groups. Table A-1 describes the key functions.

Table A-1
VT200 STYLE KEYBOARD LAYOUT

Ref	Name	Description
1	Del	Delete characters to left of cursor.
2	Editing Keys	Send same control commands to the host in both Tek and VT200 functionality. Usually used with DEC text editing application programs.
3	Indicator Lights	Indicate keyboard status, communications status
4	Mouse/Thumbwheel Connector	Connects optional mouse or thumbwheel.
5	Numeric Keypad	Allows numeric entry. ENTER key enters a RETURN.
6	Arrow Keys	Function depends on keyboard functionality.
7	Tek	Light is on in Tek keyboard functionality, on in VT200 keyboard functionality.
8	ASCII Keys	Alphanumeric keys for data entry and 4211 control.
9	Compose Character	Allows composition of characters not shown on keyboard.
10	Lock	Uppercases alphabetic characters, but does not affect numeric or special symbol keys.
11	Ctrl	<i>Control</i> . When used with another key, defines a special function of that key; often used for editing functions.
12	Esc	<i>Escape</i> . Sends the Escape character to the host.

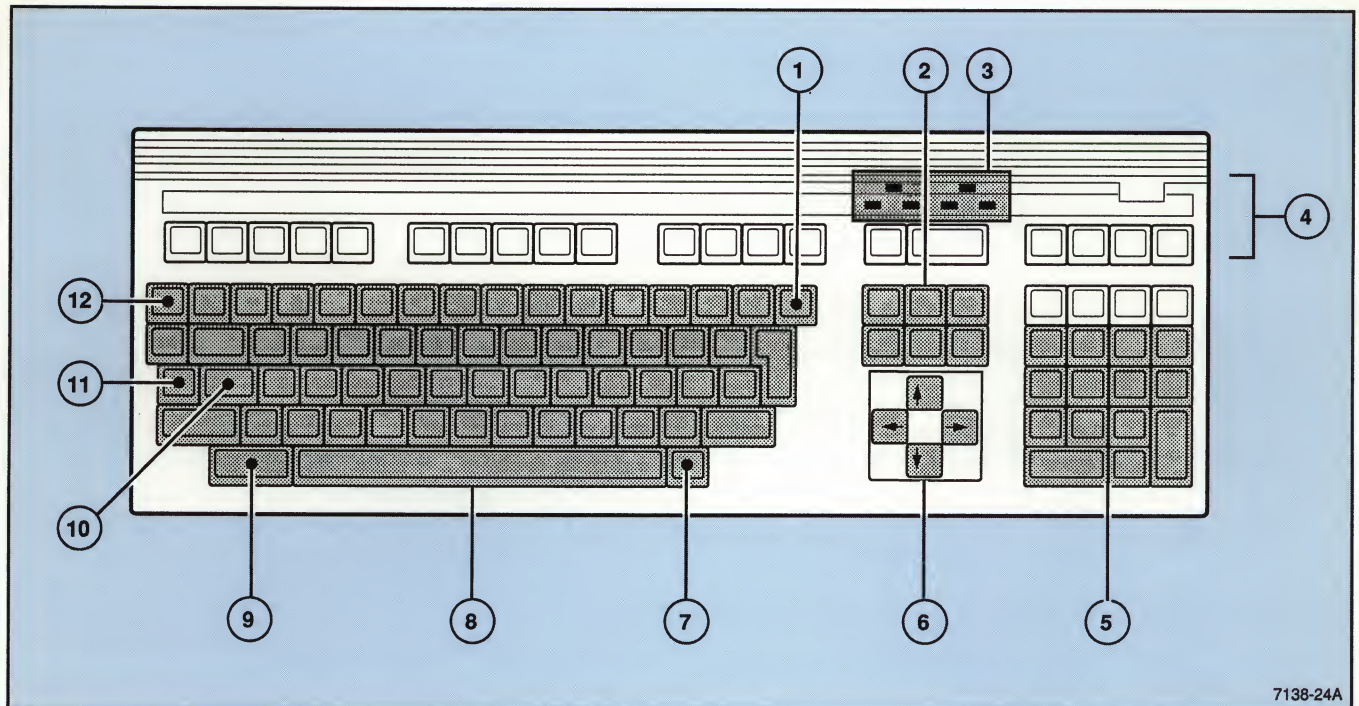


Figure A-5. VT200 Keys.

Figure A-6 and Tables A-2 and A-3 locate and identify the function of the keys when the Tek key light is off (VT200 keyboard functionality). Table A-4 shows the meaning of the indicator lights at the top of the keyboard.

Table A-2
VT200 KEYBOARD FUNCTIONALITY

Ref	Name	Description
1	Preprogrammed Function Keys	Send commands to 4211 and host and initiates copying and printing.
2	DEC user defined keys F6—F20; (Shifted function only)	Can be programmed by the host only using host command DEC user defined keys. Can be locked and unlocked using Setup command DECFUNCTIONKEYS.
3	Indicator Lights	Indicate keyboard status, communications status
4	PF1—PF4	Send control commands to the host. Cannot be user programmed in DEC mode. PF1—PF4 are not protected by the DECFUNCTIONKEYS command.
5	Arrow Keys	Allow cursor movement with DEC text editing application programs.

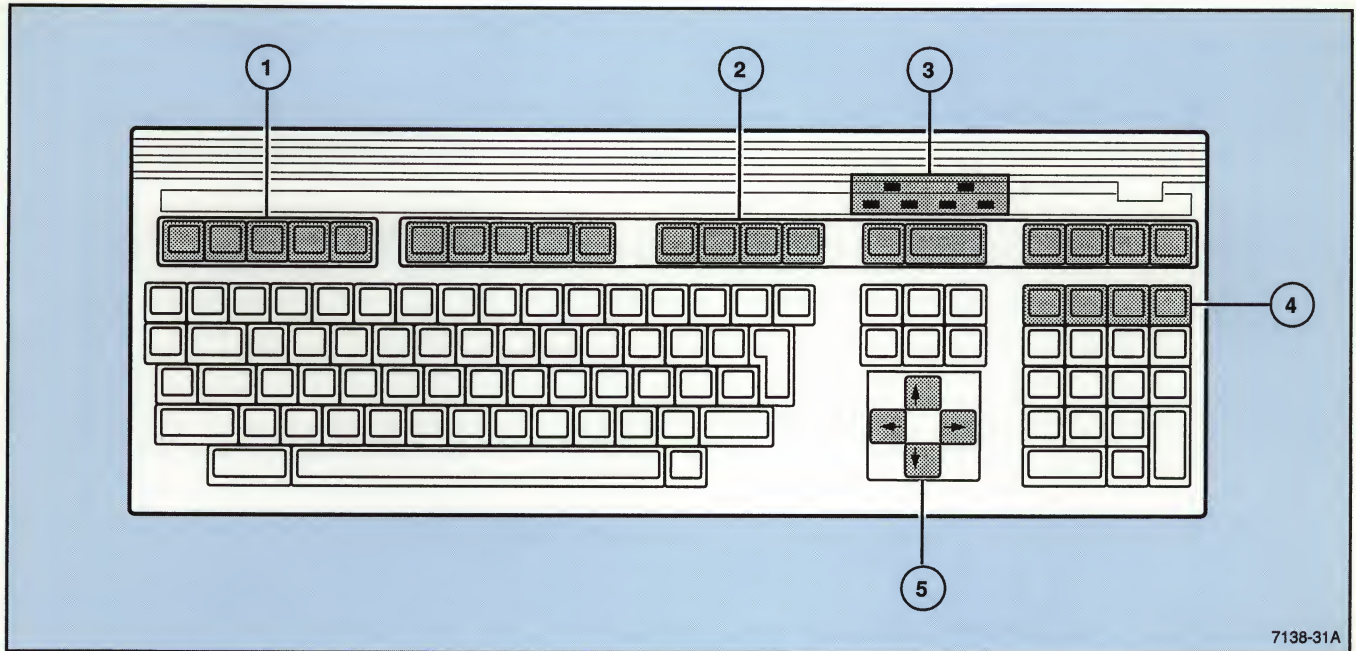
Table A-3
VT200 PREPROGRAMMED KEYS

Name	Description
Hold Screen	If FLAGGING is set to INPUT or IN/OUT, stops and starts the display of information received from some host systems.
Print Screen	Makes a copy of the screen or the dialog buffer depending on the host application.
Setup	Places the 4211 in Setup.
Menu	Accesses the Zoom/Pan functions.
Break	Sends an interrupt signal to the host computer.

Table A-4
VT200 KEYBOARD INDICATOR LIGHTS

Light	Description
Hold Screen	when flagging is enabled, lights when HoldScreen key has been pressed to stop data transmission from the host
Lock	toggles on and off when the Lock key is pressed to lock or unlock the alphabetic keys for uppercase output
Compose	lights when the ComposeCharacter key or a diacritical key is pressed; goes out when the compose sequence is complete ^a
Wait	lights when the graphics system's keyboard buffer is full or the keyboard is locked
XMT	lights when the graphics system transmits data
RCV	lights when the graphics system receives data
Tek	toggles when the Tek key is pressed — turning <i>on</i> when the keyboard's Tektronix functions are enabled and turning <i>off</i> when the keyboard's VT200 functions are enabled

^aThis key works differently on a Katakana keyboard using the NATIONAL keyboard character set, see the discussion "Composed Characters" for details.



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Figure A-6. VT200 Keyboard DEC Functionality.

Figure A-7 and Tables A-5 to A-6 locate and describe the function of the keys when the Tek key light is on (Tek keyboard functionality). Table A-4 (preceding page) shows the meaning of the indicator lights at the top of the keyboard.

Table A-5
TEK KEYBOARD FUNCTIONALITY

Ref	Name	Description
1	Preprogrammed Function Keys	Send commands to 4211 and host, initiate copying and printing, and control graphics and dialog screens and menus.
2	F1—F8	Send control commands to the host. Can be user-programmed with LEARN, DEFINE, NVLEARN, and NVDEFINE. When the Menu key, then the F2 key is pressed F1—F4 take on the Local Viewing functions. When Extended Self-Test is running, F1—F8 take on diagnostic functions.
4	PF1—PF4	Send control commands to the host. Can be user-programmed with LEARN, DEFINE, NVLEARN, and NVDEFINE.
5	Arrow Keys	Allows (1) graphics input control (use Shift with cursor pad to slow movement); (2) Zoom/Pan control (use Shift with cursor pad to slow movement); (3) dialog buffer scrolling (use Shift with cursor pad to speed movement).

Table A-6
TEK PREPROGRAMMED KEYS

Name	Description
Hold Screen	Stops and starts the display of information received from some host systems.
SCopy	Makes a copy of the screen. DCopy (Shift-SCopy) makes a copy of the dialog area.
Setup	Toggles the 4211 into and out of Setup.
Menu	Accesses the Zoom/Pan functions.
Break	Sends an interrupt signal to the host computer.
SEras	Erases the screen display and redraws segments.
GEras	Erases the graphics display and redraws segments.
DEras	Erases the dialog display.
Cancel	Stops 4211 operations in process.
Dialog	Turns the dialog visibility on or off.

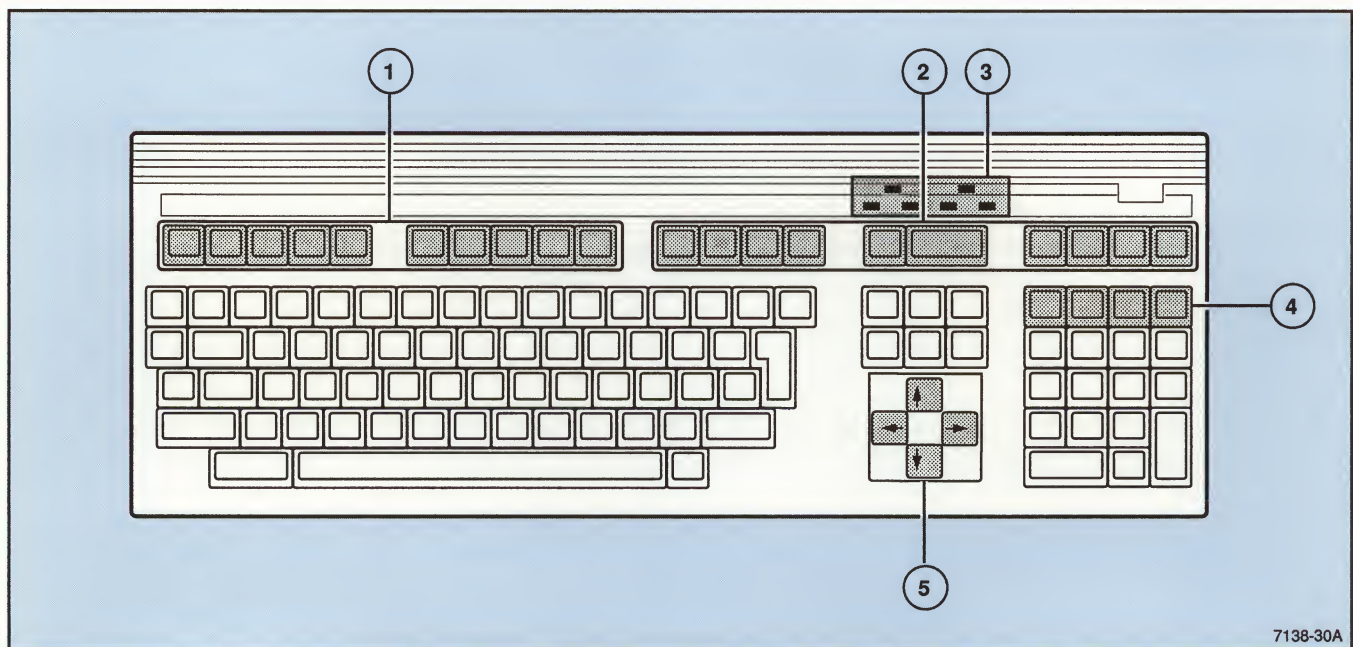


Figure A-7. VT200 Keyboard Tektronix Functionality.

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COAX KEYBOARD

The coax keyboard includes:

- ASCII/EBCDIC Keys — Sends ASCII in RS232 or EBCDIC in coax
- Tek special function keys
- IBM special function keys
- VT200 special function keys
- Numeric keypad — 18 keys for numeric entry and program functions
- Indicator lights
- Arrow keys for cursor control and graphics input
- Connectors for an optional mouse or thumbwheels
- A Tek key, which toggles between Tek and VT200 keyboard functionality

Table A-7 Shows the Coax keyboard layout.

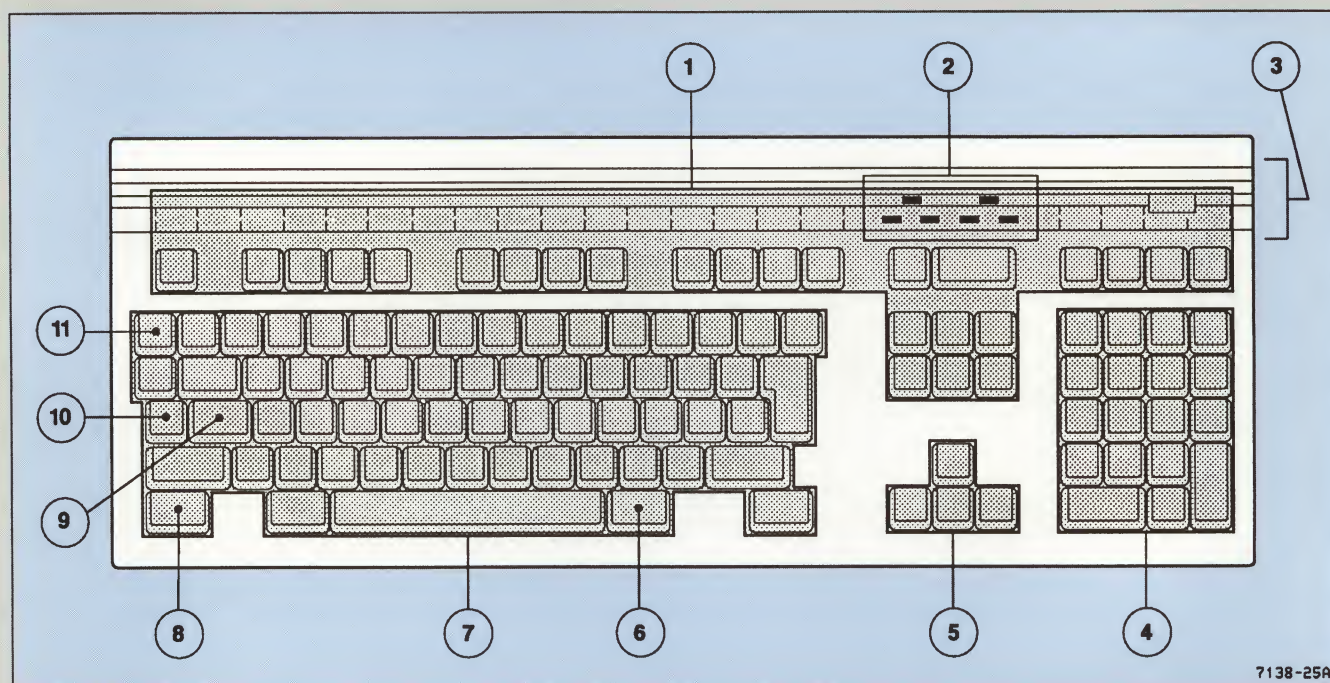
DIFFERENCES FROM IBM KEYBOARD

Except for extra sets of keys used with graphics features and minor functional differences in some keys, the layout and function of the coax option keyboard resembles an IBM enhanced type keyboard (see Figure A-8). Here are the exceptions:

- *Arrow keys* — In HOSTPORT HO:, scroll text in the dialog area. The keys also move the cursor when Zoom/Pan or *graphics input* (GIN) is enabled.
- *Numeric keypad* — A set of number keys that make numeric data easier to enter. The keys can also be used as additional programmable function keys. Use of the keypad is described later in this appendix.
- *Tektronix function keys* — Five right most keys control graphics and Tektronix-unique functions. Keys F1 through F12 are programmable function keys. Some of these function keys temporarily take on special definitions when the Menu function is active. See Section 6 for details about the Menu function.
- The Tek and Line Feed keys are used in HOSTPORT HO:.

Table A-7
COAX KEYBOARD LAYOUT

Ref	Name	Description
1	Special Function Keys	Preprogrammed keys and programmable keys which have preassigned functions in special circumstances.
2	Mouse/Thumbwheel Connector	Connects optional mouse or thumbwheel.
3	Indicator Lights	Indicate keyboard status, communication status
4	Numeric Keypad	Allows numeric entry. ENTER key enters a RETURN.
5	Arrow Keys	Function depends on keyboard functionality.
6	Alt	When used with another key, defines a special function or alternate character. Used mostly for IBM functions.
7	ASCII Keys	Alphanumeric keys for data entry and 4211 control.
8	Compose Character	Allows composition of characters not shown on keyboard.
9	Lock	Uppercases alphabetic characters, but does not affect numeric or special symbol keys (in HOSTPORT COAX doesn't uppercase top row of numbers).
10	Ctrl	<i>Control</i> . When used with another key, defines a special function of that key; often used for editing functions.
11	Tek	Light is on in Tek keyboard functionality.



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Figure A-8. Coax Keyboard Layout.

KEYBOARD OPERATION IN HOSTPORT COAX


All keys take on their standard 3179G meanings according to their legends or symbols. Function keys unique to the 4211 operate in HOSTPORT COAX.

Color-coded legends on some keys indicate functions that are unique to HOSTPORT COAX or HOSTPORT HO:. Here's the explanation of the colors that apply in HOSTPORT COAX:

- **Black only** — Operates similarly to IBM 3179G key or has a Tektronix-unique function that is the same for both host port connections.
- **Blue and black** — Operates according to the legend in black.
- **Blue only** — Has no predefined function; can be programmed with macro functions.

Figure A-9 (next page) and Table A-10 locate and describe the function of the keys when the 4211 is in HOSTPORT COAX. Table A-11 shows the meaning of the indicator lights during IBM 3179G/3192G emulation.

Table A-8
IBM SPECIAL FUNCTION KEYS

Key	Function
AltCr	Selects alternate cursor — either block, blinking block, underline, or blinking underline.
Attn	Requests host program's attention (effective only when <i>B</i> symbol is displayed in the operator information area).
Clear	Clears screen (including GDDM graphics information), sets up an unformatted display, and positions cursor at Row 1, Column 1 (may also reset screen size to 24x80, depending on configuration).
 (Click)	Toggles key click.
CrBnk	Toggles cursor blink.
CrSel	Moves cursor across formatted displayed list to make selection from list of alternate items (replacing light pen).
|<— (Del)	Moves cursor to start of preceding unprotected field.
Delete	Deletes character at cursor position in input field, moving subsequent characters in the field to the left to avoid leaving a blank space.
DevCncl	Cancels a Print or Ident request.
Dup	Requests that the application program duplicate a field entry (causes display of an overscored asterisk).
Enter	Causes typed data to be sent to the host; also used to terminate Setup commands.
ErasEOF	Erases or blanks characters from the cursor position to the end of the field.
Erlnp	Erases or blanks all displayed input fields.
FieldMark	Sets an end-of-field mark (causes display of an overscored semicolon).

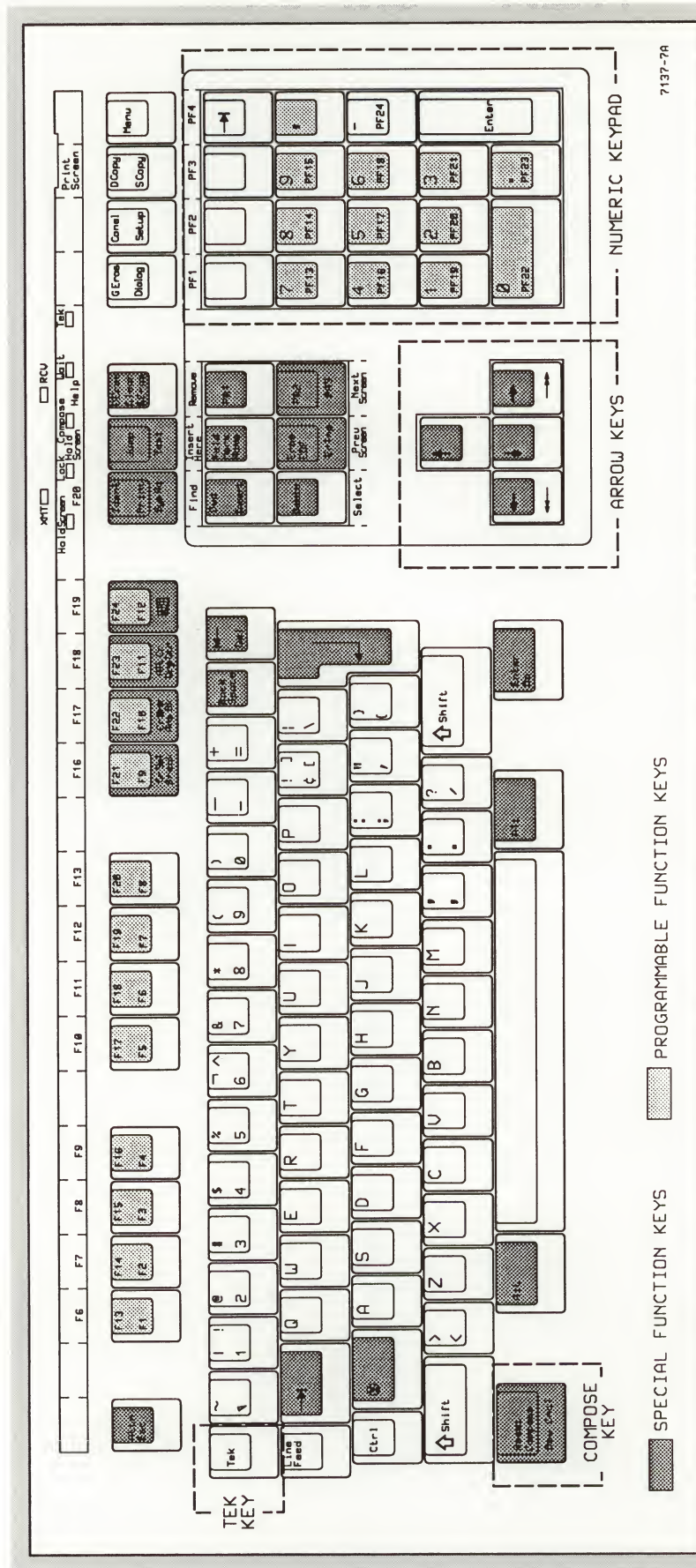


Figure A-9. Coax Keyboard Layout: IBM Functions.

**Table A-8 (cont.)
IBM SPECIAL FUNCTION KEYS**

Key	Function
Home	Moves cursor to first unprotected field in the display.
Ident	In CUT mode, depending on Printer Status display, either (1) requests or changes printer ID for a print operation, or (2) displays current print authorization.
Insert	Inserts one or more characters in input field without replacing displayed characters (pressing Reset exits Insert mode).
Jump	<i>Normal State:</i> In DFT mode, switches to next sequential session.
	<i>Shifted State:</i> Toggles host port between HOSTPORT COAX and HOSTPORT HO:..
PA1	Sends PA1 signal to application program.
PA2	Sends PA2 signal to application program.
PA3	Sends PA3 signal to application program.
Print	In CUT mode, prints displayed information on printer connected to IBM 3174 or 3274 control unit.
Reset	Exits Insert mode; restores graphics system to its status before the last key-entry error.
Return	Moves cursor to start of next unprotected field below current line.
SysReq	When <i>A</i> symbol is displayed in operator information area, signals host that 4211 may be failing, and that operator has keyed a Test Request message.
	When <i>B</i> symbol is displayed in operator information area, clears screen and switches graphics system between application and control program.
Tab	Moves the cursor to the start of the next unprotected field
Test	In CUT mode, prepares 4211 for testing by control unit — refer to <i>IBM Control Unit Problem Determination Guide</i> .
Arrows	Allows cursor movement.

**Table A-9
COAX KEYBOARD INDICATOR LIGHTS — IBM
3179G/3192G EMULATION**

Light	Description
HoldScreen	Not used
Lock	toggles on when the Lock key is pressed to lock the alphabetic keys for uppercase output and off when a Shift key is released
Compose	Not used
Wait	lights when the graphics system's keyboard buffer is full or the keyboard is locked
XMT	Not used
RCV	Not used
Tek	always <i>on</i> when IBM 3179G/3192G emulation is enabled

KEYBOARD OPERATION IN HOSTPORT HO:

The keyboard keys take on the same functions as a Tektronix 4200 Series terminal keyboard. Here's the explanation of the color-codes that apply in HOSTPORT HO:

- *Black only* — Operates as typical Tektronix 4200 Series key or is available as extra programmable function key if legend is relevant only to IBM 3179G emulation.
- *Blue and black* — Operates according to the legend in blue.
- *Blue only* — Operates according to legend.
- *Black and Red* — Key action depends on state of Tek key: key operates according to the black label when Tektronix functions are selected (that is, when Tek light is on) and according to red label when VT200 functions are selected (that is, when Tek light is off). If the black label is relevant only to IBM 3179G emulation, the red label is always used.

Figure A-10 (next page) and Table A-12 locate and describe the function of the keys when the 4211 is in HOSTPORT HO: and the Tek key light is off (VT200 keyboard functionality). Table A-13 shows the meanings of the indicator lights when DEC functionality is selected.

Table A-10
VT200 SPECIAL FUNCTION KEYS

Key	Action
AnsBk	Sends the Answerback message to the host (logical device HO:); unlocks the keyboard if it's locked.
Break	Sends a break signal to the host (logical device HO:); unlocks the keyboard if it's locked.
Compose	Allows composition of characters not shown on keyboard.
DropDtr	Drops the DTR and RTS signal lines on the host port (logical device HO:); unlocks the keyboard if it's locked.
Find	Sends the control sequence ESC [1 ~, recognized by some VT200 applications as a Find command.
HoldScreen	<i>Flagging mode enabled:</i> if the Hold Screen indicator is not lit, lights it and sends DC3 to the host. If the indicator is already lit, turns it off and sends DC1 to the host.
InsertHere	Sends the control sequence ESC [2 ~, recognized by some VT200 applications as a Insert Here command.

Table A-10 (cont.)
VT200 SPECIAL FUNCTION KEYS

Key	Action
Menu	Provides access to the Local Viewing system and to the Coax Configuration menu.
NextScreen	Sends the control sequence ESC [6 ~, recognized by some VT200 applications as a Next Screen command.
PrevScreen	Sends the control sequence ESC [5 ~, recognized by some VT200 applications as a Prev Screen command.
Print	<i>Normal or Ctrl Action:</i> Prints a dialog copy (extent of copy depends on TEKPEX command): <i>Shift or Ctrl-Shift Action:</i> Toggles data logging on and off.
Remove	Sends the control sequence ESC [3 ~, recognized by some VT200 applications as a Remove command.
Select	Sends the control sequence ESC [4 ~, recognized by some VT200 applications as a Select command.
Setup	Toggles in or out of Setup syntax mode.
Arrows	Application dependent cursor movement.

* In eight-bit C1 Transmission mode, selected with the C1TRANSMISSION command, this sequence starts with CSI, which is the eight-bit equivalent of the ESC [seven-bit control sequence shown here.

Table A-11
COAX KEYBOARD INDICATOR LIGHTS — DEC VT100/VT200 EMULATION

Light	Description
Hold Screen	when flagging is enabled, lights when HoldScreen key has been pressed to stop data transmission from the host
Lock	toggles on and off when the Lock key is pressed to lock or unlock the alphabetic keys for uppercase output
Compose	lights when the ComposeCharacter key or a diacritical key is pressed; goes out when the compose sequence is complete*
Wait	lights when the graphics system's keyboard buffer is full or the keyboard is locked
XMT	lights when the graphics system transmits data
RCV	lights when the graphics system receives data
Tek	toggles when the Tek key is pressed — turning on when the keyboard's Tektronix functions are enabled and off when the keyboard's VT200 functions are enabled

*This key works differently on a Katakana keyboard using the NATIONAL keyboard character set, see the discussion "Composed Characters" for details.

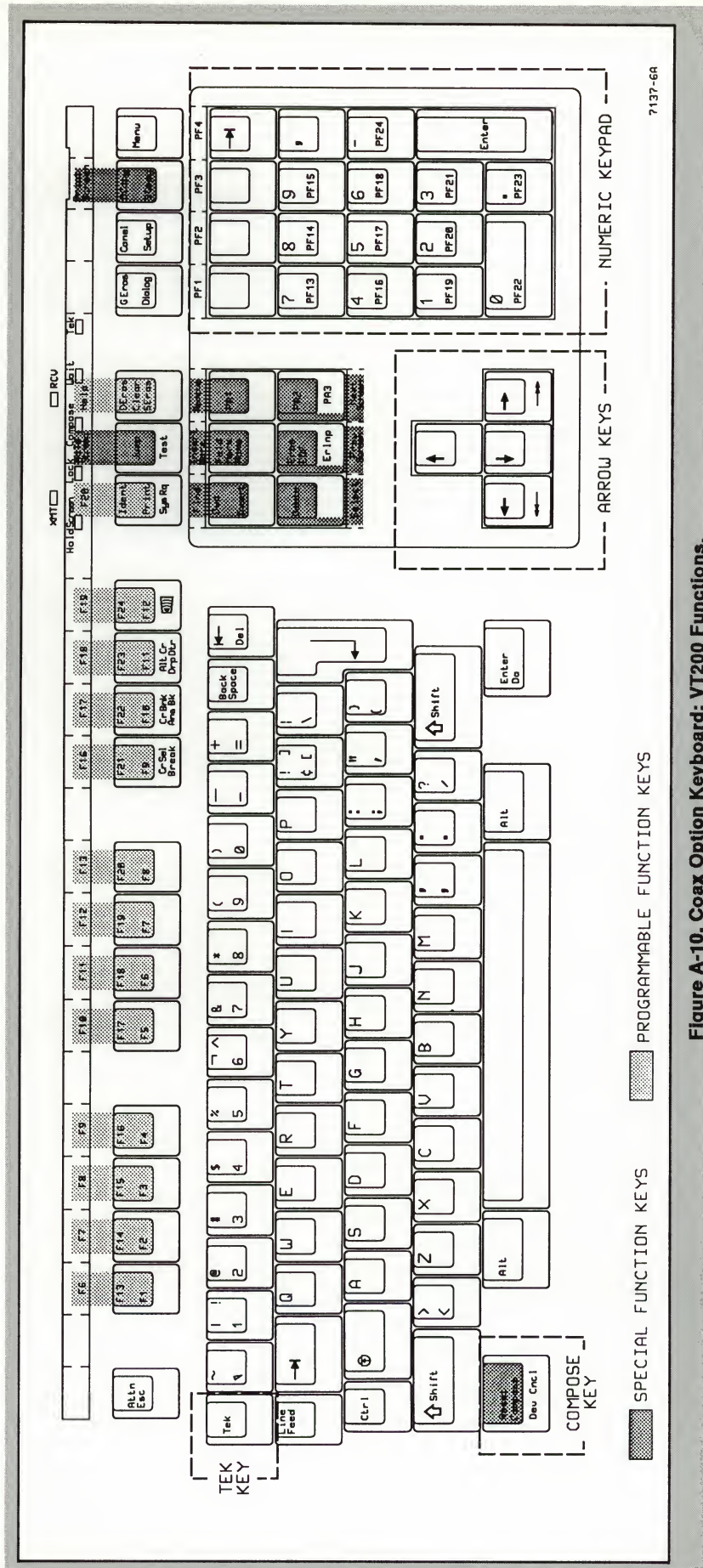


Figure A-10. Coax Option Keyboard: VT200 Functions.

Figure A-11 and Table A-14 locate and describe the function of the keys when the 4211 is in HOSTPORT HO: and the Tek key light is on (Tek keyboard functionality). Table A-15 shows the meanings of the indicator lights when Tektronix keyboard functionality is selected.

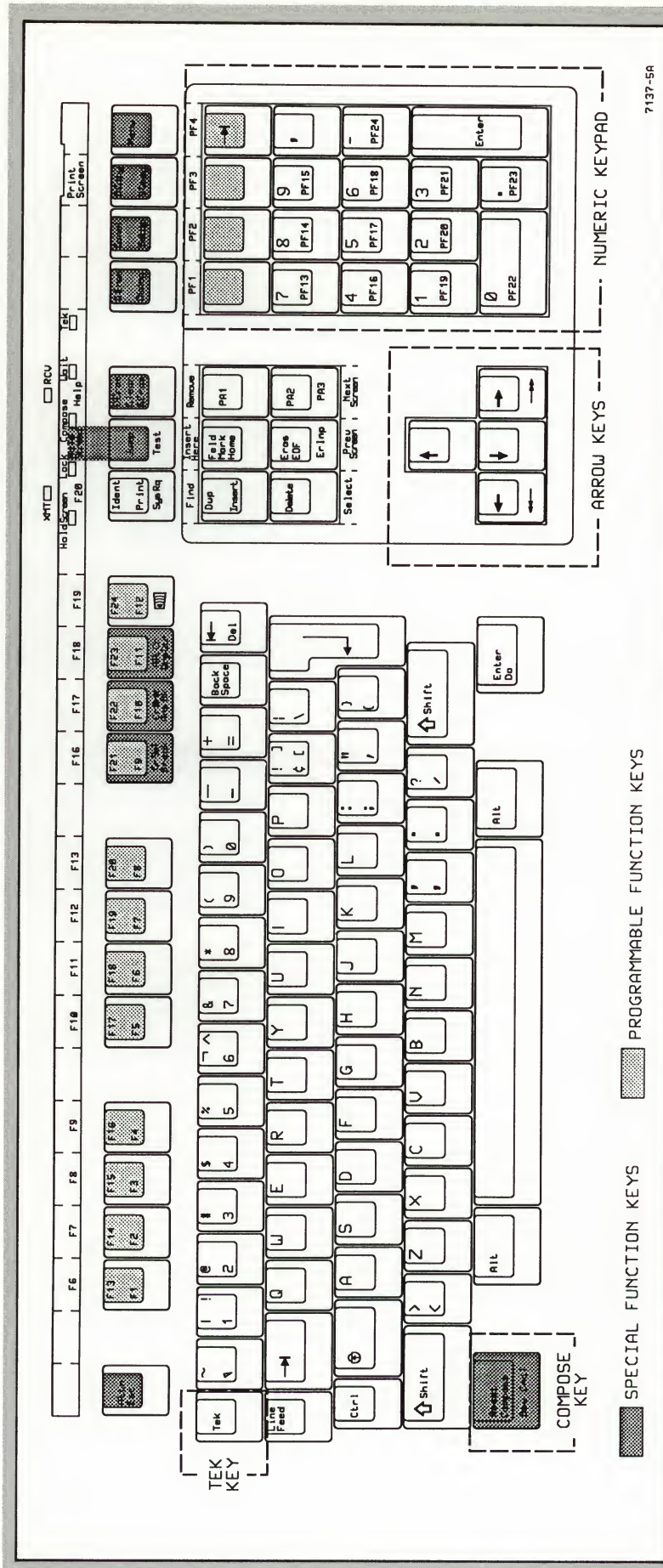
Table A-12
COAX OPTION KEYBOARD LAYOUT:
TEKTRONIX FUNCTIONS

Key	Action
AnsBk	Sends the Answerback message to the host (logical device HO:); unlocks the keyboard if it's locked.
Break	<i>Normal Action:</i> Sends a break signal to the host (logical device HO:); unlocks the keyboard if it's locked.
Cancel	Cancels copies and other operations. Unlocks the keyboard if it is locked.
Compose	Allows composition of characters not shown on keyboard.
DCopy	Copies the dialog area; copy attributes are controlled by HCDAATTRIBUTES command. <i>Ctrl Action:</i> Copies the entire screen.
DEras	Same as the CLEAR-DIALOG-SCROLL command.
Dialog	<i>Normal Action and Ctrl Action:</i> Makes the dialog area visible or invisible. <i>Shift Action and Ctrl-Shift Action:</i> Overrides the currently enabled dialog area's visibility locally — that is, without changing the DAVISIBILITY command's settings. (The visibility settings reported to the host are the DAVISIBILITY settings, not the local-override settings.)
DropDtr	Drops the DTR and RTS signal lines on the host port (logical device HO:); unlocks the keyboard if it's locked.
GEras	Erases the graphics area or, if views have been defined, erases the current view.
Hold Screen	Stops and starts the display of information received from some host systems.
Menu	Provides access to the Zoom/Pan functions.
SCopy	<i>Normal Action:</i> Copies entire screen. <i>Ctrl Action:</i> Copies entire screen without reversing black and white.
SEras	Erases entire screen display and dialog buffer (if views have been defined, erases the current view and the dialog buffer).
Setup	Toggles in or out of Setup syntax mode.
Arrows	Allows both scrolling of dialog buffer and graphics input.

Table A-13
COAX KEYBOARD INDICATOR LIGHTS — TEK EMULATION

Light	Description
Hold Screen	when flagging is enabled, lights when HoldScreen key has been pressed to stop data transmission from the host
Lock	toggles on and off when the Lock key is pressed to lock or unlock the alphabetic keys for uppercase output
Compose	lights when the ComposeCharacter key or a diacritical key is pressed; goes out when the compose sequence is complete*
Wait	lights when the graphics system's keyboard buffer is full or the keyboard is locked
XMT	lights when the graphics system transmits data
RCV	lights when the graphics system receives data
Tek	toggles when the Tek key is pressed — turning <i>on</i> when the keyboard's Tektronix functions are enabled and <i>off</i> when the keyboard's VT200 functions are enabled

*This key works differently on a Katakana keyboard using the NATIONAL keyboard character set, see the discussion "Composed Characters" for details.



NUMERIC KEYPAD AND PROGRAM FUNCTION KEYS

You can select between two ways of using the keypad — to enter numbers, or to access functions provided by an applications program. The following topics show how to control the functions of the keypad.

Using the Keypad In HOSTPORT COAX

To control keypad operation, put the 4211 in Setup and enter the CXKEYPAD command according to the following examples:

- To use the keypad as IBM function keys PF13 through PF24, enter:

CXKEYPAD PF

- To use the keypad to enter the numbers 1 through 9, enter:

CXKEYPAD NUMERIC

- To use the Shift or Shift Lock key to define whether the keypad is to be used as an alphanumeric keypad (shifted) or as a pad of Programmed Function keys (unshifted), enter:

CXKEYPAD BOTH

Remember to press the Setup key again so that you can begin using the keypad.

Using the Keypad In HOSTPORT HO:

To control keypad operation, put the 4211 in Setup and enter the KEYPADMODE command according to the following examples:

- To use the keypad as numeric keys, enter:

KEYPADMODE NUMERIC

- To use the keypad as function keys for an applications program, enter:

KEYPADMODE APPLICATIONS

Remember to take the 4211 out of Setup to use the keypad.

SETUP COMMANDS CORRESPONDING TO 3279 CONTROLS

The following commands perform functions that are controlled by keys or switches on the IBM 3279. To use these commands, be sure the 4211 is in Setup, enter the commands, and then press the Setup key once again. For more information about entering Setup commands, refer to Section 3.

To display the current settings for one of these commands before you enter it, enter the STATUS command followed by the first few letters of the command that you want to check. For example, if you wanted to check the setting for the BASECOLOR command, enter the STATUS command in the following form:

STATUS BASECOLOR

Switching Displayed Colors (BASECOLOR)

In HOSTPORT COAX, the BASECOLOR command emulates the BASE COLOR switch on IBM 3279 Terminals. The command lets you specify whether characters in formatted input fields are to be displayed in just one color or multiple colors:

- To display text in green with white intensified fields, enter:

```
BASECOLOR MONOCHROME
```

- To display formatted fields in red, green, blue, and white characters, enter:

```
BASECOLOR BASE
```

If you changed the color definition for items currently displayed in green to be displayed in orange, a BASECOLOR MONOCHROME command would give you a display of orange and/or white text.

The BASECOLOR command has no effect when the host has selected an extended menu of colors.

Changing Character Case (CAPITALS)

In HOSTPORT COAX, this command selects whether alpha characters are displayed as all uppercase or as mixed uppercase and lowercase characters. Unlike the effect of the Caps Lock key, the CAPITALS command does not affect the characters sent to the host. In other words, regardless of how the characters are displayed locally on the 4211, they are transmitted to the host in the same case in which you type them.

Here's how to set the display of character casing:

- To display text as all uppercase characters, enter:

```
CAPITALS YES
```

- To display text as a mix of uppercase and lowercase characters, enter:

```
CAPITALS NO
```

Setting Key Clicking (CLICK)

In HOSTPORT HO:, this command enables or disables the key click sound. (When in HOSTPORT COAX, use the Key Click key to perform the same function — but not in Setup.)

See the discussion "Key Click" in Section 7 for information on how to use the CLICK command.

Setting the Cursor Type (CURSORTYPE)

In HOSTPORT HO:, this command sets the alphanumeric cursor either to an underlined cursor or to a block cursor (when in HOSTPORT COAX, use the Alt Cursor key to perform the same function).

See the discussion "Cursor Type" in Section 7 for information on how to use the CURSORTYPE command.

SELF TEST DIAGNOSTIC PROGRAM

The Self Test diagnostic programs allow you to test the 4211 Graphics Netstation and its interaction with peripherals. The Self Test program reports any errors on the screen; these error messages help locate the probable source of the problem.

If a Self Test error message appears on the screen, write it down. These error messages will help you or a service technician diagnose the problem more quickly.

LEVELS OF SELF TEST

The 4211 has three Self Test levels:

- **Power-Up Self Test** — Power-Up Self Test runs automatically every time the 4211 is turned on or reset. It performs a quick check of circuitry before allowing the 4211 to be used. Power-Up Self Test takes approximately 30 seconds to complete, and requires no user interaction.
- **Main Self Test** — Contains all the tests performed by Power-Up Self Test, plus more extensive tests of 4211 circuitry, particularly memory. Main Self Test displays a menu from which you can enter Extended Self Test.
- **Extended Self Test** — Provides interactive tests that allow you to check the keyboard and the 4211's interaction with peripherals. Portions of Extended Self Test are also used by service technicians to adjust and calibrate the display.

Figure B-1 illustrates how the three levels of Self Test are related.

ERROR REPORTING

When Self Test detects an error, it writes a message on the screen and rings the keyboard's bell. If the test detects a keyboard error, the Lock light or all the keyboard lights remain lit, depending on what portion of the system failed.

Self Test errors are listed as single-lined items on the screen.

If a Self Test error message appears on the screen, write it down. These error messages will help you or a service technician to diagnose the problem more quickly.

The error message might disappear after displaying for a few minutes. This allows you to use the 4211 if the error is not severe.

USER INTERACTION

When Self Test displays a Menu on the screen followed by the prompt *Selection:*, the 4211 is waiting for your input before continuing. Just press the appropriate function key from those listed on the menu. In addition, some tests ask you to connect peripheral devices or connectors to the 4211's ports; for these tests, just follow the instructions that appear on the screen.

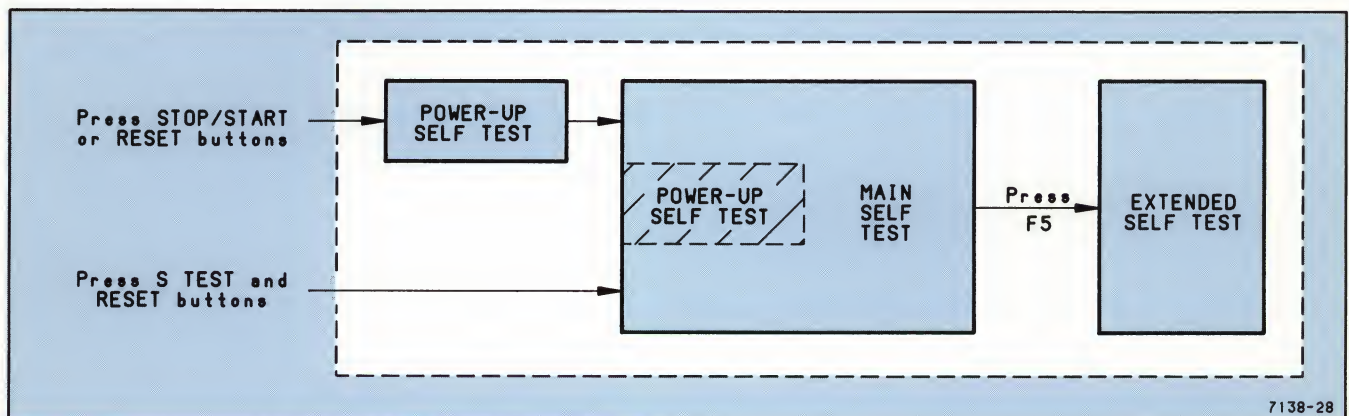


Figure B 1. Levels of Self Test.

POWER-UP SELF TEST

Power-Up Self Test runs every time you turn on the 4211 or push the RESET button. This test checks the Graphics module, the keyboard (if it is connected), then checks the circuitry in the Display module.

Approximately three seconds after your 4211 begins Self Test, the keyboard lights come on and then stay on until Power-Up Self Test is complete. Then they will turn off. If a portion of the test fails, the lights stay on. A message may also be written on the screen.

If there is a problem in the Display module or Graphics module, the 4211 writes a message on the screen and rings the bell twice. (If the bell rings twice and no message appears, try turning up the Brightness button.)

If Power-Up Self Test does not detect any errors, the 4211 displays an underline or block cursor when the test is complete.

POWER-UP SELF TEST ERRORS

All Power-Up Self Test errors are listed as single-lined items after the words *Self Test Error*. If a Self Test error occurs during power-up, follow these procedures:

1. Press the RESET button on the front of the Graphics module. This causes the 4211 to rerun Power-Up Self Test. If no errors are detected, the 4211 is operating normally.
2. If a Self Test error occurs during the second Power-Up Self Test, note the message — then:
 - If the message includes the words *Keyboard Self Test Failed*, check the keyboard cable connection on the back of the Graphics module.
 - If the message includes the words *Nonvolatile Parameters reset to factory defaults*, after completion of the Power-Up Self Test sequence, you may have to reset some operating parameters before running an applications program. Consult the communications command table in Section 4 of this manual for the proper settings.

If these methods fail, or if any other messages appear, write them down and call your Tektronix service center. The service technician may ask you to remove the circuit board access door and note the status of certain indicator lights on some 4211 components.

You can still use the 4211 if the failure does not affect your application. For example, if one of the peripheral ports failed and your application doesn't require that port, you could go ahead and use the 4211 until the problem is fixed.

MAIN SELF TEST

Main Self Test contains a number of tests, some of which are only run by service technicians. If you simply need to verify that the 4211 is functioning properly, run the portion of Main Self Test that we show you here. (If necessary, refer to Appendix A for illustrations and explanations of the keys and controls you will use in these steps.)

1. Locate the SELF TEST and RESET buttons on the front of the Graphics module.
2. Press SELF TEST and hold it in. While holding in SELF TEST, press and release RESET. Continue to hold in SELF TEST for another two seconds, and then release it.

After about seven seconds, the keyboard bell beeps once and this menu is displayed:

Main Self Test Menu

F2	Self Test
F3	Continuous Self Test
F5	Extended Self Test Menu
F7	Redisplay Main Menu
F8	Enter Terminal Mode

Selection:

3. Press Function Key F2 (at the top right of the keyboard) to continue Self Test. (If you don't press a key within 20 seconds after the Main Self Test Menu appears, Self Test continues automatically.)

After about six minutes, if no errors are detected, the Main Self Test Menu is redisplayed. At this point, you can exit this portion of Main Self Test or continue to test the 4211:

- Pressing F3 causes Self Test to execute repeatedly. To get out of this continuous testing mode, you must press the RESET button or turn the 4211 off. Normally, you should not use this test cycle.
 - Pressing F4 cycles you through a portion of Extended Self Test that the factory uses to test the 4211. Normally, you should not use this test cycle.
 - Pressing F5 displays the Extended Self Test Menu. It is from this menu that you select specific peripheral devices and 4211 components to test.
 - Pressing Function Key F7 blanks the screen and then redisplay the Main Self Test Menu.
 - Pressing Function Key F8 exits Main Self Test and returns the 4211 to normal operations.
4. Press F8 to exit Main Self Test and return the to normal operations, or press F5 to access the Extended Self Test Menu, which allows you to test the keyboard and peripherals.

If the 4211 does detect an error, it rings the keyboard bell twice, or writes a message on the screen, or both. (If no message appears, try turning up the Brightness button.)

EXTENDED SELF TEST

Use Extended Self Test to test specific parts of the 4211 as well as test the 4211's interaction with peripheral devices.

If the Extended Self Test Menu is not already displayed on the 4211 screen, you will need to rerun a portion of Main Self Test. Just press in the SELF TEST button and hold it in while you press and release RESET, then hold in SELF TEST for another two seconds and release it. Then, when you see the Main Self Test menu appear, press Function Key F5, which displays the Extended Self Test Menu:

Extended Self Test Menu

F1 Reset Nonvolatile Parameters
 (to Factory Settings)
 and Enter Terminal Mode

F2 Keyboard Menu
F3 RS-232 Interface Menu
F4 Hardcopy Menu
F5 Display Pattern Menu
F6 Graphics Tablet Test

Sh F1 Coax Interface Test
Sh F2 LAN Interface Menu

F7 Exit Current Menu
F8 Enter Terminal Mode

Selection:

Once the Extended Self Test Menu is displayed, the 4211 waits for you to press one of the function keys:

- Pressing F1 resets all parameters to their factory default values. Don't press F1 unless you are sure you don't want to keep settings saved in nonvolatile memory.
- Pressing F2 through F5 displays the menu indicated by its title.
- Pressing F6 begins the graphics tablet test.
- Pressing Sh F1 (Shift-F1) begins the coax interface test for the Coax option.
- Pressing Sh F2 (Shift-F2) displays the LAN interface menu for the LAN option.
- Pressing F7 redisplay the Main Self Test Menu.
- Pressing F8 exits Extended Self Test and returns normal operations.

To start one of the tests or to display another menu, just press the appropriate function key. The rest of this appendix describes each of these menu items.

NOTE

This discussion only covers the areas of Extended Self Test that typical users need. Some menu items are for internal adjustment of the 4211 and are normally performed by service personnel. For a discussion of these parts of Extended Self Test, refer to the service manual for your 4211.

F1: RESET NONVOLATILE PARAMETERS

CAUTION

Pressing F1 resets all parameters — including the communications parameters — to their factory defaults. Unless you want all parameters reset to their factory defaults, do not press F1.

Pressing F1 from the Extended Self Test Menu resets all parameters to their factory defaults, just as the FACTORY command followed by an NVSAVE command does. Then this message is displayed:

Nonvolatile Parameters
Reset to Factory Defaults

Selection:

Now all volatile and nonvolatile parameters are at factory default, and the 4211 prompts you for another selection from the Extended Self Test Menu.

CAUTION

The 4211's nonvolatile memory will sustain approximately ten thousand resets. This should be sufficient for many years of normal operations. However, to prolong the life of the memory, it is best to reset nonvolatile parameters only when necessary.

F2: KEYBOARD MENU

Pressing F2 from the Extended Self Test Menu displays the Keyboard Menu:

Keyboard Menu

```
F1    Keyboard Echo
F2    Mouse/Thumbwheels Verification
F3    Bell Test

F7    Exit Current Menu
F8    Enter Terminal Mode
```

Selection:

Just select the item from the menu that you want to test, press the appropriate function key, and then follow the instructions that appear on the screen.

F3: RS-232 INTERFACE MENU

NOTE

To run these tests, you need an RS-232 loopback connector. This is not a standard accessory, but can be ordered as an optional accessory (see Section 1 for ordering information).

Pressing F3 from the Extended Self Test Menu displays the RS-232 Interface Menu:

RS-232 Interface Menu

```
F1    Computer (Host) Port Test
F2    Port 0 Test
F3    Port 1 Test

F7    Exit Current Menu
F8    Enter Terminal Mode
```

Selection:

The following paragraphs describe each part of the RS-232 Interface Menu.

COMPUTER Port Test

Pressing F1 from the RS-232 Interface Menu starts the Host Port Test, and displays this message:

```
Install Computer Port Loopback...
Press any key to continue
```

Disconnect the cable connected to the COMPUTER port and connect the host port loopback connector in its place. Then press any key to start the test.

If the test finishes with no errors detected, the 4211 displays the following message and prompts you for another selection from the RS-232 Interface Menu:

```
Test Completed
```

```
Selection (Press SEras for Menu):
```

If an error is detected, the bell rings twice, and the 4211 displays the error as a single-lined item followed by this message:

```
Error(s) Detected
Test Completed
```

```
Selection (Press SEras for Menu):
```

PORT 0 and PORT 1 Tests

Pressing F2 from the RS-232 Interface Menu starts the PORT 0 Test, and pressing F3 starts the PORT 1 Test. In this discussion, we will assume that you have pressed F2, in which case the 4211 displays this message:

```
Peripheral Port Test
```

```
Connect Computer (Host) Port cable
to Port 0...
Press any key to continue
```

Connect an RS-232 cable to PORT 0, making sure the cable is also connected to the host port (labeled *COMPUTER*). Press any key to execute the test.

If the test finishes with no errors detected, the 4211 displays the following message and prompts you for another selection from the RS-232 Interface Menu:

```
Test Completed
```

```
Selection (Press SEras for Menu):
```

Self Test Diagnostic Program

If an error is detected, the bell rings twice, and the 4211 displays the error as a single-lined item followed by this message:

```
Error(s) Detected
Test Completed
```

Selection (Press S ERas for Menu):

F4: HARDCOPY MENU

Pressing F4 from the Extended Self Test Menu displays the Hardcopy Menu:

Hardcopy Menu

```
F1      Loopback Test
F7      Exit Current Menu
F8      Enter Terminal Mode
```

Selection:

The following paragraphs describe each part of the Hardcopy Test.

COPIER Port Loopback Test

NOTE

To run the COPIER port loopback test, you must have a COPIER port loopback connector. This is not a standard accessory, but may be ordered as an optional accessory (see Section 1 for ordering information).

Pressing F1 from the Hardcopy Menu starts the COPIER port loopback test and displays the following message:

Copier Port Test

```
Install Copier Port Loopback...
Press any key to continue
```

Disconnect any cable connected to the COPIER port and connect the COPIER port loopback connector. Then press any key to start the test.

If the test finishes with no errors detected, the 4211 displays the following message and prompts you for another selection from the Hardcopy Menu:

Test Completed

Selection (Press S ERas for Menu):

If an error is detected, the bell rings twice, and the 4211 displays the error as a single-lined item followed by this message:

```
Error(s) Detected
Test Completed
```

Selection (Press S ERas for Menu):

F5: DISPLAY PATTERN MENU

Pressing F5 from the Extended Self Test Menu displays the Display Pattern Menu. The patterns in this menu are used for making internal adjustment to the 4211 and for checking color graphics copiers. Refer to the *4211 Service Manual* for more information.

Display Pattern Menu

F1 Grid Pattern
 F2 Grey Scale Pattern
 F3 White Screen Pattern
 F4 Color Pattern
 F5 H Pattern
 F6 Crosshairs Test

Sh F2 Alternating Pixel Pattern
 Sh F3 Dot Pattern

HoldScreen Toggle Red Video On and Off
 (use Dialog on CX keyboard)
 SCopy Toggle Green Video On and Off
 Setup Toggle Blue Video On and Off
 Sh HldScrn Increment Red Intensity
 (use Sh Dialog on CX keyboard)
 Sh SCopy Increment Green Intensity
 Sh Setup Increment Blue Intensity

Menu Redisplay Pattern Menu

F7 Exit Current Menu
 F8 Enter Terminal Mode

Selection:

F6: GRAPHICS TABLET TEST

This test checks the 4211's interaction with a TEKTRONIX 4957 or 4958 Graphics Tablet. Pressing F6 from the Extended Self Test Menu starts the Tablet Test and displays the following message:

Graphics Tablet Test

Connect Tablet to Port 1...
 Press any key to continue

Connect the tablet to PORT 1 (if it's not already), then press any key to start the test. If the test finishes with no errors detected, one of these messages is displayed on the screen (for this discussion, we'll assume that the 4211 is connected to a 4657 Tablet):

4957 Tablet
 Passed - Cursor on Tablet [4F].

Test Completed

Selection (Press SEras for Menu):

Or:

4957 Tablet
 Passed - Cursor off Tablet [47].

Test Completed

Selection (Press SEras for Menu):

If an error is detected, the bell rings twice, and the 4211 displays the error as a single-lined item followed by this message:

Error(s) Detected
 Test Completed

Selection (Press SEras for Menu):

SH F1: COAX INTERFACE TEST

Pressing Sh F1 (Shift-F1) begins the Coax Interface Test; this is only valid for a 4211 with the Coax option. If you have this option and want to test it, just press Sh F1 and follow the directions that appear on the screen.

SH F2: LAN INTERFACE MENU

Pressing Sh F2 (Shift-F2) from the Extended Self Test Menu displays the LAN Interface Menu. For more information on the LAN tests, refer to the *4211 Service Manual*.

LAN Interface Menu

F1 LAN Interface Test (Internal Loopback)
F2 LAN External Loopback Test
F3 Review LAN Ethernet Number

F7 Exit Current Menu
F8 Enter Terminal Mode

Selection:

F1: LAN Interface Test (Internal Loopback) Pressing F1 from the LAN Interface Menu selects the internal LAN test. This test checks the LAN board memory and performs an internal loopback test of the LAN controller logic.

F2: LAN External Loopback Test Pressing F2 from the LAN Interface Menu selects the external LAN test. This test sends a "short packet" of data onto an actual network and receives the packet back. It then verifies that the packet was received properly by the interface and that the sent and received data match.

F3: Review LAN Ethernet Number Pressing F3 from the LAN Interface Menu displays the following information where the actual number (represented in this example by Xs) is the unique Ethernet number of your 4211:

LAN Interface Network Number Review

Current Ethernet Number: XX:XX:XX:XX:XX:XX

F7 Exit Current Menu
F8 Enter Terminal Mode

Selection:

F7: EXIT CURRENT MENU

Pressing F7 always redisplay the previous menu. When pressed in the Main Self Test Menu, it simply blanks the screen and redisplay the Main Self Test Menu.

F8: ENTER TERMINAL MODE

Pressing F8 exits Main Self Test or Extended Self Test. Then the 4211 is reset and the Power-Up Self Test runs. After about 30 seconds, the underline or block cursor is displayed and the 4211 is ready to use, as if it had just been powered up.

C

SPECIFICATIONS

4211 Operator

SPECIFICATIONS

This section contains specifications that relate to the installation and use of the 4211. A complete list of specifications is included in the *4211 Field Service Manual*.

The following terms are used in these specification tables:

- **Performance Requirement** — Statements that define characteristics essential to the intended application of the product. Self Test verifies many of these characteristics.
- **Supplemental Information** — Statements that describe typical performance for characteristics of secondary importance, or that further explain related performance requirements.

**Table C-1
GRAPHICS MODULE**

Characteristic	Performance Requirement
Weight	15 lb (6.82 kg)
Width	20.5 in (520.7 mm)
Height	3.6 in (91.44 mm)
Depth	12.175 in (309.25 mm)

**Table C-2
DISPLAY MODULE**

Characteristic	Performance Requirement	
	15" Display	19" Display
Weight with stand	55 lb (25 kg)	61.7 lb (28 kg)
Depth	17.7 in (450 mm)	19.3 in (490 mm)
Width	15.7 in (400 mm)	19.1 in (486 mm)
Height with stand	15.6 in (397 mm)	18.7 in (475 mm)
Display area	10.5x8 in (272x204 mm)	13.6x10.2 in (346x260 mm)

**Table C-3
VT200 KEYBOARD**

Characteristic	Performance Requirement
Weight	3.4 lbs (1.55 kg)
Length	19.75 in (501 mm)
Height:	
Bail retracted	1.6 in (41 mm)
Bail extended	2.5 in (64 mm)
Depth	7.2 in (184 mm)

**Table C-4
COAX KEYBOARD**

Characteristic	Performance Requirement
Weight	3.4 lbs (1.55 kg)
Length	18.4 in (467.4 mm)
Height:	
Bail retracted	1.6 in (40.6 mm)
Bail extended	2.2 in (55.9 mm)
Depth	7.2 in (182.8 mm)

**Table C-5
OPTIONAL MOUSE**

Characteristic	Performance Requirement
Weight	6 oz (0.17 kg)
Length	2.6 in (66 mm)
Height	1.1 in (27.9 mm)
Depth	3.7 in (94 mm)

**Table C-6
OPTIONAL THUMBWHEELS**

Characteristic	Performance Requirement
Length	4 in (102 mm)
Height:	
Bail retracted	1.7 in (44.5 mm)
Bail extended	2.5 in (63.5 mm)
Depth	7.2 in (184 mm)

Table C-7
GRAPHICS MODULE ELECTRICAL SPECIFICATIONS

Characteristic	Performance Requirement
Nominal input voltage 115V 230V	87 — 128 Vrms @ 48 — 66 Hz 174 — 265 Vrms @ 48 — 66 Hz
Max. input power	115 W
Main fuse	3A/250V (not accessible)
Video Out	RS343 Voltage levels 75Ω impedance out

Table C-8
DISPLAY MODULE ELECTRICAL SPECIFICATIONS

Characteristic	Performance Requirement	
	15" Display	19" Display
Nominal input voltages 115V 230V	90 — 132V 180 — 264V	90 — 132V 180 — 264V
Main fuse 115V 230V	4A 125V 3.15A 250V	4A 125V 3.15A 250V
Maximum input power	140 W	200 W
Frequency range	48 — 63Hz	48 — 63Hz

Table C-9
ENVIRONMENTAL SPECIFICATIONS

Characteristic	Performance Requirement
Temperature	
Power on	+50 to +104° F (+10 to +40° C)
Power off	–40 to +140° F (–40 to +60° C)
Altitude	
Power on	To 15,000 ft (4593 m)
Power off	To 50,000 ft (15,244 m)
Humidity	
Power on	20 to 80% relative humidity (non-cond.)
Power off	10 to 95% relative humidity (non-cond.)
Electrostatic immunity	
Power on	No interruption of operation, loss of data, or change of operating mode from 15 kV discharge.
Power off	No damage to the 4211 from 20 kV discharge.
Electromagnetic interference	FCC Class A VDE Level B
Safety	UL CSA

Table C-10
INSTALLATION REQUIREMENTS

Characteristic	Supplemental Information
Heat dissipation 15-inch display 19-inch display Graphics module	478 BTU/hr 478 BTU/hr 340 BTU/hr
Graphics module Surge current 110 V 220 V	At turn on 12 A (typical) 12 A (typical)
Graphics module Cooling clearance Sides Back Top	No clearance required 3 in (76 mm) No clearance required
Distance from EMI sources	Modules should be as far removed from motors, fans, or other electromagnetic devices as possible

Table C-11
COMMUNICATIONS CHARACTERISTICS

Characteristic	Supplemental Information
RS-232-C Host port	38.4K baud
RS-232-C Peripheral port	38.4K baud
Coax Host port	IBM compatible SNA network
LAN	IEEE 802 TCP/IP protocol Telnet
Parallel port	Centronics compatible or Tektronix Parallel Interface protocol

Table C-12
GRAPHICS CHARACTERISTICS

Characteristic	Supplemental Information
Addressability	1024 horizontal by 768 vertical pixels
Graphics command syntax	Tek, GDDM
Line styles	Solid, dashed
Graphics primitives	Arcs, lines, panels, markers, Pick IDs, segment calls, alphanumerics, graphtext
Number of colors available	Two color palettes available (4096 or 16.7 M colors)
Interactive graphics	Cursor pad on keyboard, optional mouse, thumbwheels can control the cross-hair graphics cursor.
Pixels	Direct pixel operations: write, copy, Boolean
Standard memory	.75M bytes
Memory options	1M bytes (total 1.75M bytes) 2M bytes (total 2.75M bytes)

Table C-13
HARDCOPY COMPATIBILITY

Characteristic	Supplemental Information
Color screen copy	TEKTRONIX 4692, 4693D, 4693RGB, and 4696, ColorQuick printers; Alps ALQ 324e printer; Epson LQ-2500 printer.
Monochrome screen copy	TEKTRONIX 4644; DEC LA210 Letterprinter and LN03 Laser Printer; Epson FX-80- and LQ-2500-compatible printers; Hewlett-Packard DeskJet, LaserJet+, and LaserJet Series II.
Plotter	TEKTRONIX 4662 and 4663 Printer and 4510A Rasterizer; Hewlett-Packard 7475A and 7550A plotters and other HPGL-compatible plotters.

Table C-14
ALPHANUMERIC CHARACTER SETS

Characteristic	Performance Requirement
Character sets	International sets: North American (ASCII) Danish/Norwegian French German Greek Italian JIS Kanji* JIS Katakana JIS Roman Spanish Swedish Swedish Names Swiss-German United Kingdom Special character sets: ASCII Supplemental DEC Rulings DEC Supplemental DEC Technical HP Supplemental Tektronix 4696 Supplemental Tektronix ColorQuick Supplemental Tektronix Supplemental
Character format	Screen display 4 character formats available: 64 rows x 170 characters, character cell size 6 x 12 pixels 48 rows x 146 characters, character cell size 7 x 16 pixels 48 rows x 128 characters, character cell size 8 x 16 pixels 34 rows x 85 characters, character cell size 12 x 22 pixels

*Requires Sony/Tek Option 4L.

ALPHABETICALLY
INDEXED
BY
NAME
OF
PERSON
OR
FIRM

1918

1919

1920

1921

1922

1923

1924

1925

1926

1927

1928

1929

1930

1931

1932

1933

1934

1935

1936

1937

1938

1939

1940

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TEKTRONIX COLOR STANDARD

UNDERSTANDING COLOR DEFINITIONS

You can change the *color definition* assigned to an index using the CMAP command. For example, you could change the color definition assigned to Index 2 from red (the default) to yellow; then, every part of an image that uses Index 2 would become yellow.

The HLS color system allows you to change color definition. A color definition is the mixture of hue, lightness and saturation (HLS) values that define a particular color. Hue is expressed in degrees (0 through 360), and lightness and saturation are expressed in percentages of lightness and darkness.

Table D-1 lists the HLS values for some common colors.

Table D-1
HLS VALUES FOR COMMON COLORS

Color	Hue Setting (degrees)	Lightness Setting (percent)	Saturation Setting (percent)
Blue	0	50	100
Brown	150	30	100
Cyan	300	50	100
Green	240	50	100
Dark Gray	0	33	0
Light Gray	0	66	0
Magenta	60	50	100
Olive	240	30	100
Orange	150	50	100
Pink	120	80	100
Purple	60	30	100
Red	120	50	100
White	0	100	0
Yellow	180	50	100

CHANGING INDEX DEFINITIONS

You can use the CMAP command to change the color definitions for the indices in both the dialog and graphics areas. For example, you can use the CMAP command to change the color definitions for the indices in the graphics area. You could change the color definition for Index 4 (blue) in the graphics area to green by assigning it the HLS values that define green (these values are shown in Table D-1). You would enter the following command:

```
CMAP 1, 4, 240, 50, 100
```

The graphics will appear green instead of blue wherever Index 4 is assigned.

You could also change the color definition for Index 3 (green) in the dialog area to orange by assigning it the HLS values that define orange (Table D-1 shows these values). You would enter the following command:

```
CMAP 1, 3, 150, 50, 100
```

The dialog text will appear orange instead of green. You have changed the definition of Index 3 in the dialog area from green to orange.

TEKTRONIX COLOR STANDARD

In the **HLS** color coordinate system, the color space is represented as a double-ended cone.

The **HUE** coordinate runs counterclockwise around the cone. (0 to 360 degrees.)

The **LIGHTNESS** coordinate runs vertically up the cone. (0% to 100%.)

The **SATURATION** coordinate runs radially outward from the axis of the cone. The **SATURATION** coordinate is a percentage of the maximum possible saturation at a particular **LIGHTNESS** level. (0% to 100%.)

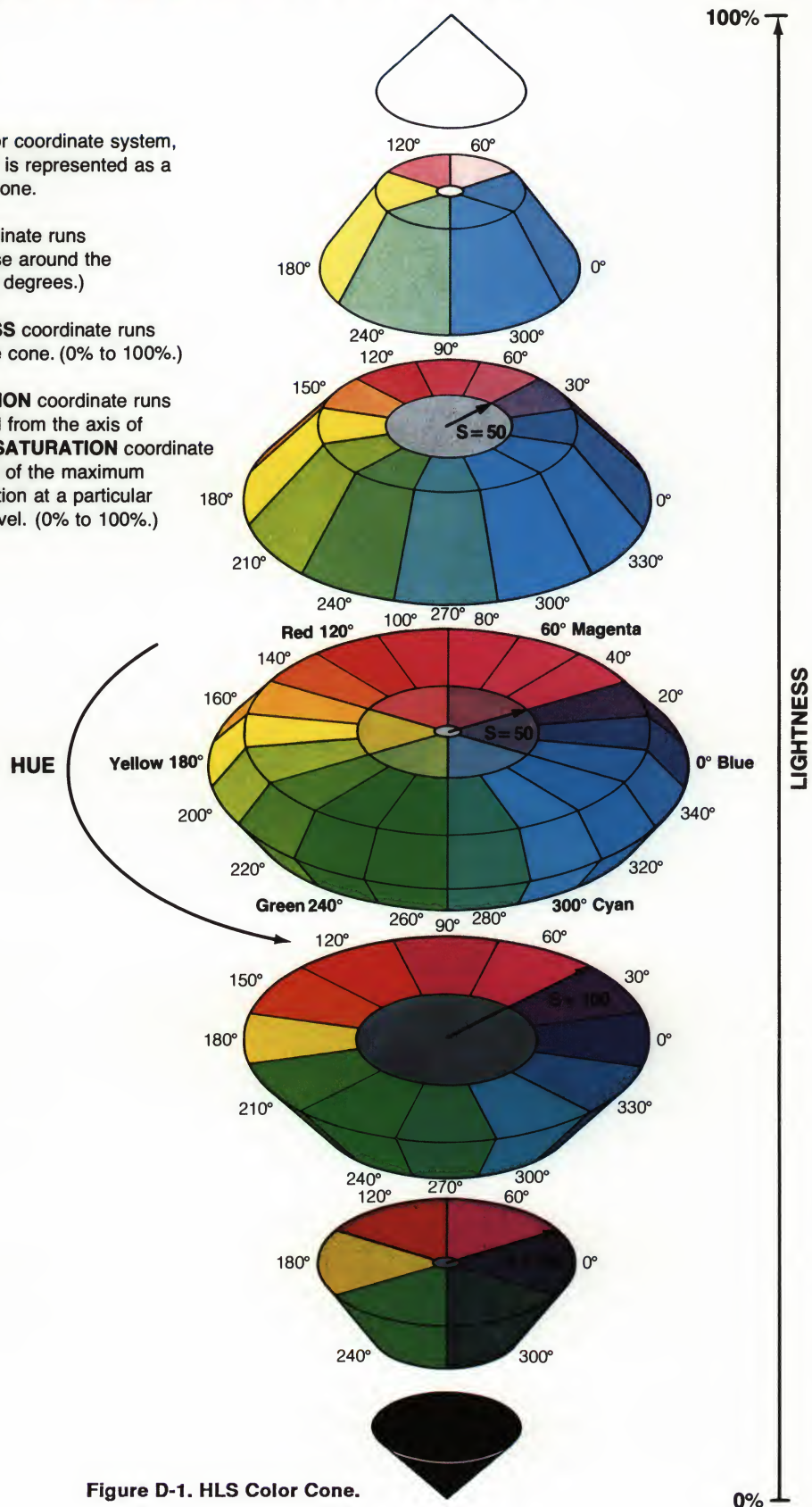


Figure D-1. HLS Color Cone.

(continued)

OVERVIEW

The world of color is filled with ambiguous terminology, i.e., intensity, purity, value, etc. Many color users feel that "color theory" is a prerequisite to operating color systems: TV, videotaping, photography, computer graphics.

To end this confusion, Tektronix has developed a color language and function based on human engineering, rather than machine engineering. The following is a description of this system, which will provide a clear and concise means for understanding how color is defined and how our syntax was derived.

COLOR CONCEPTS

Color selection is specified by hue, lightness and saturation which is the HLS method. The definitions are as follows:

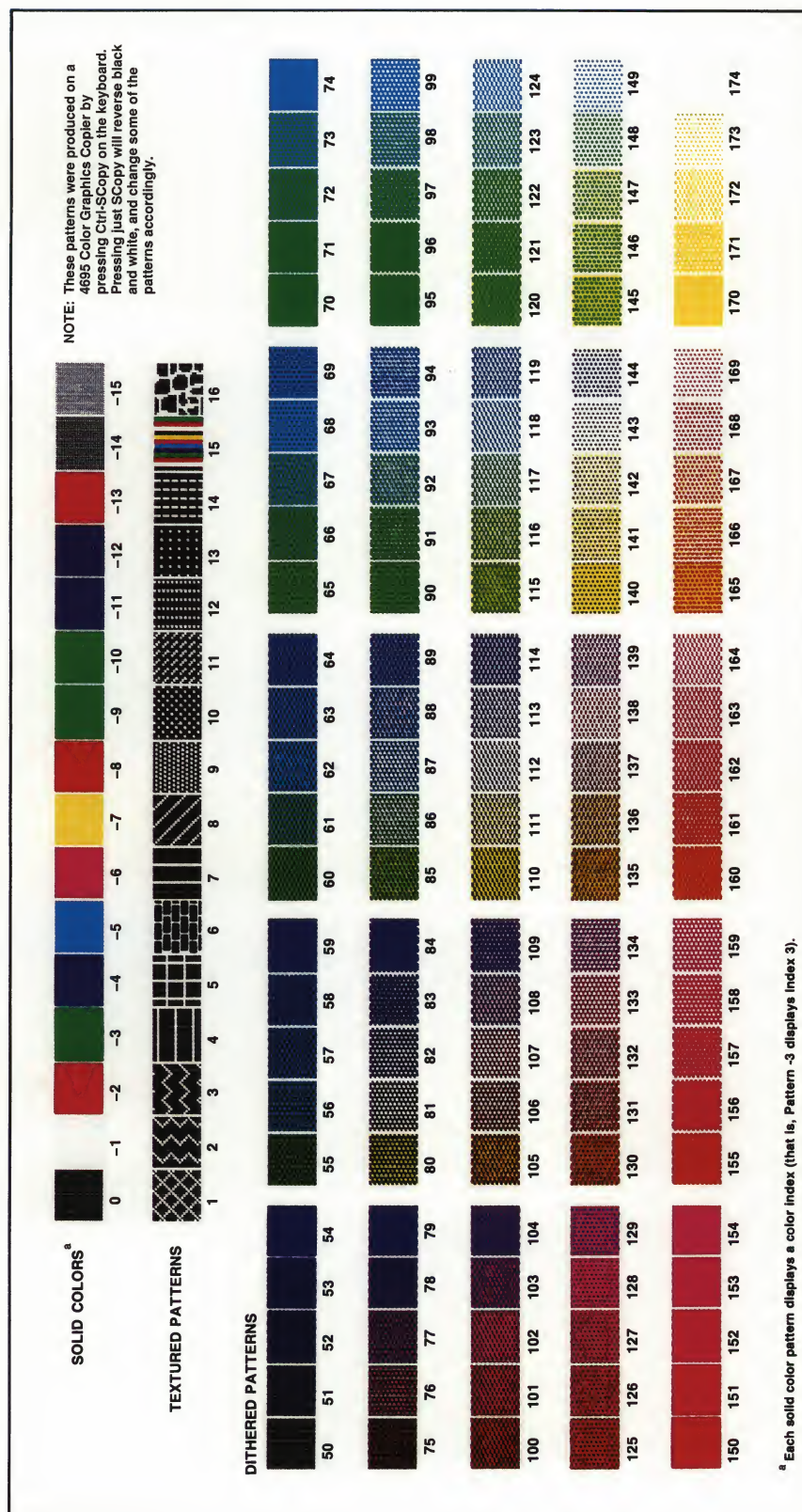
- Hue:** The characteristic associated with a color name such as red, yellow, green, blue, etc. Hue is a gradation of color advanced by degrees, thus represented as an angle from 0 to 360.
- Lightness:** The characteristic that allows the color to be ranked on a scale from dark to light. Lightness is expressed as a parameter ranging from 0 to 100% with black being 0% (bottom of cone) and white being 100% (top of cone).
- Saturation:** The characteristic which describes the extent to which a color differs from a gray of the same lightness. Saturation is expressed as a percentage, ranging from 0% (maximum white content at that lightness level) to 100% (fully saturated).

Geometrically, colors can be described in terms of a double cone. Variations in lightness are represented along the axis, with white at the apex of the cone and black at the opposite apex. Variations in saturation are represented by radial distances from the lightness axis, in constant lightness planes. Hue is represented as an angular quality from a known reference point.

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PREDEFINED FILL PATTERNS**Figure E-1. Predefined Fill Patterns.**

(continued)

NOTES ON FILL PATTERNS

This netstation contains predefined patterns for filling *panels* (polygons). A sample of each pattern, along with its pattern number, is shown in Figure E-1.

To use one of these patterns, issue the **FILLPATTERN** command with the appropriate pattern number. The pattern that you specify will fill the next panel drawn (panels are drawn using the **BEGINPANEL** and **ENDPANEL** commands).

Each pattern shown in Figure E-1 consists of one or more colors from the factory-default color map. If the color map is changed, the appearance of some or all of these patterns will change accordingly. The color map can be changed with the **CMAP** command.

IBM STATUS SYMBOLS

When the terminal is in HOSTPORT COAX, symbols or a combination of symbols are displayed in the operator information area to show the current status of the terminal

and the 3274/3276 Control Unit. A list of the symbols and their explanations is provided in Table F-1. Your IBM documentation explains these symbols in greater detail.




























Table F-1
COAX STATUS SYMBOLS

Symbol ^a	Explanation
	3274 Control Unit is ready.
	3276 Control Unit is ready.
I	4331 Unit is ready.
S	3174 Control Unit is ready.
A	Control Unit connected online to host.
B	Control Unit connected online to host.
	Terminal busy with application job.
	Terminal connected to system operator (control program).
	Terminal connected to host but not to application or control program.
TEST	Terminal is in Online Test mode.
N	Terminal connected to host through X.21 switched network.
	Wait for system to perform a function (system is busy).
C	DFT session is not configured in the 3274.
SESSION: a	Session a is currently displayed (DFT only).
	Press RESET and retry operation.
	Keyboard locked by host. Wait for message, or press RESET.
	Move to other screen location for function. Press RESET, or take alternative action.
	Too much data for field. Press RESET and reenter less data.
	Enter only numerals in this field. Press RESET and enter numerals.
	Can only enter certain numerals. Press RESET and enter correct numerals.
	Terminal is in Local mode and communication not allowed. Press RESET.
or	Requested function not available.
or	Terminal not operating properly. Try running Self Test diagnostics or refer to your IBM documentation.
or	Problem with communication line between host and terminal. Refer to your IBM documentation.
or	Detected programming error in host data. Press RESET. If problem continues, refer to your IBM documentation.
	Printer connected to terminal is busy. Either wait for printer to complete task or press Dev Cncl key to cancel pending print request. (Pressing Dev Cncl does not cancel printing operation currently in progress.)

^a In the Symbol column, n refers to an integer variable; a refers to a letter in the range A through E and denotes the current host session.

(continued)

Table F-1 (cont.)
COAX STATUS SYMBOLS

Symbol ^a	Explanation
	Message identical to previous one but will be busy for a longer time.
	Printer connected to terminal is not working. Either wait or press Dev Cncl key to cancel print request.
	Not authorized to perform function. Press RESET.
	(French keyboard only) Entered an invalid accent and character combination. Press RESET and enter correct accented character.
	
	
	
	
	Pressed an unavailable symbol key. Press RESET.
	Requested message from control operator. Press RESET.
	Attempted to make an unauthorized Color, PS, or Highlighting Selection.
 99 or  599	Control unit is in Local mode.
 nn or  nnn	Communication link between Control Unit and host producing errors.
SO	The base symbol set was selected.
NUM	Terminal keyboard has been placed in Numeric mode. Only the characters 0 through 9, minus sign (-), and Dup will be accepted.
TEXT	Terminal keyboard has been placed in Text mode.
	The terminal keyboard is in the upshifted position.
	Terminal in Insert mode.
	Reverse video selected for screen display.
	Blinking character has been selected for cursor location.
	Underscored character has been selected for cursor location.
	Displayed color has been selected.
	Selected color is one of the following by default: red, green, or white by default.
	Displays selected numerals when changing the Printer ID/Class.
	Terminal authorized to use Printer ID/Class nn.
	Selected printer currently is printing requested work.
	Printer stopped while printing current job.
	Printer assignment changed.

^a In the *Symbol* column, *n* refers to an integer variable; *a* refers to a letter in the range *A* through *E* and denotes the current host session.

COMMAND SUMMARY

INTRODUCTION

This Command Summary covers commands available on the Tektronix 4211 Graphics Netstation. In this document, we use the term *graphics system* to refer to the 4211 and other Tektronix terminals.

WHAT IS IN THIS COMMAND SUMMARY

Information you'll find in this summary includes:

- **Cross-Reference Lists** — Lists that cross-reference all the commands available for this graphics system:
 - A list of commands grouped by function — the functions correspond to sections of the Programmers Manual (see "Finding More Information").
 - A list of commands by their longer descriptive name
 - A list of commands by opcode
 - A list of PLOT 10 STI routines by command name
 - A list of commands by STI routine
 - A list of the commands that can be saved in nonvolatile memory
- **Syntax Summaries** — A summary of the syntax conventions and a description of the parameter and report types.
- **Command Summaries** — Brief descriptions of all commands recognized by the 4211, including the syntax, parameters, and default settings for each command. (Each description also points to the section of the *4210 Series Programmers Manual* that contains a full description of the command.)
- **Keyboard Layouts** — Illustrations that show key positions and macro numbers for each key on standard and Coax option keyboards (North American/ASCII version), as well as the optional mouse and thumbwheels.

- **Code Charts** — Code charts for:

- Eleven national character sets that support the optional national keyboards: Danish/Norwegian, French, German, Italian, Katakana, Spanish, Swedish, Swiss-German, and United Kingdom, plus a Greek national character set not associated with an optional keyboard
- Eight Supplemental character sets (ASCII Supplemental, DEC Rulings, DEC Supplemental, DEC Technical, Tek Supplemental, Tek 4696 Supplemental, Tek ColorQuick Supplemental, and Hewlett-Packard Supplemental)
- The North American EBCDIC character set (for coax keyboards)
- 7-bit ASCII Code Chart (shows North American character set)
- 8-bit ASCII Code Chart (shows control characters)

INFORMATION FOR OPERATORS

This Command Summary provides extensive cross-referencing of the graphics system's commands and gives more details about how to enter them from the keyboard. In particular, there is more detailed information about the function of each command's parameters and about the valid values you can use for these parameters.

Although this summary shows the host and Setup syntax for all commands available on your graphics system, you must use Setup syntax to enter commands from the keyboard. (The computer uses host syntax to send commands to your graphics system.)

Generally, you'll be using this graphics system to run specific programs on a host computer. If you have questions about the program you are using, consult the documentation that is supplied with it.

INFORMATION FOR PROGRAMMERS

This summary shows the host escape sequences and parameter values you can use to issue the graphics system's commands from a host application. It does *not* include introductory or conceptual information about the commands, details about how commands interact, or details about the encoding schemes that you must use in sending parameter values from the host. This conceptual information and details of the commands' functions and interaction are provided in the Programmers Manual.

NOTE

*This command summary does **not** describe commands in detail. For the level of information needed to write application programs, see the **4210 Series Programmers Manual**. In this summary, each command's short description contains a pointer to the section of the Programmers Manual in which the full command description can be found—for example, the first command 4010-HARDCOPY has the pointer “§11 Peripherals.”*

Toward the end of this summary, you'll find some tools of particular interest to programmers:

- Charts showing the macro numbers available on standard and Coax option keyboards (including the optional mouse and thumbwheels). The charts in this summary are for the North American/ASCII version; the Programmers Manual contains charts for other keyboards.
- ASCII and EBCDIC code charts.

FINDING MORE INFORMATION

For more information about the capabilities of your graphics system (including detailed discussion of the commands described in this summary), see the *4210 Series Programmers Reference Manual* (part number 070-7137-00). You can order this manual through your local Tektronix Field Office.

CROSS REFERENCE LISTS

COMMANDS BY FUNCTION

The commands are arranged in functional categories that correspond to sections in the *4210 Series Programmers Manual*.

Command Name	Description
SYSTEM INITIALIZATION	
CANCEL	CANCEL COMMAND
DA	DEVICE-ATTRIBUTES
DECTERMINAL	DECTERMINAL
FACTORY	FACTORY
GRESOLUTION	GRAPHICS-RESOLUTION
NVSAVE	SAVE-NONVOLATILE-PARAMETERS
RESET	RESET
TEKID	IDENTIFY-TERMINAL
TEKSCL	SET-COMPATIBILITY-LEVEL
TEKSE	SAVE-ENVIRONMENT
TERMINAL	SET-TERMINAL-MODEL

COMMAND SYNTAX

APC	APPLICATION-PROGRAM-COMMAND
CAN	CANCEL
CODE	SELECT-CODE
COORDINATEMODE	SET-COORDINATE-MODE
CSI	CONTROL-SEQUENCE-INTRODUCER
DCS	DEVICE-CONTROL-STRING-INTRODUCER
EDITCHARS	SET-EDIT-CHARS
ENTER-ALPHA-MODE	ENTER-ALPHA-MODE
ENTER-ANSI-MODE	ENTER-ANSI-MODE
ENTER-MARKER-MODE	ENTER-MARKER-MODE
ENTER-VECTOR-MODE	ENTER-VECTOR-MODE
ESC	ESCAPE
IGNOREDEL	IGNORE-DELETES
OSC	OPERATING-SYSTEM-COMMAND
PM	PRIVACY-MESSAGE
ST	STRING-TERMINATOR
SUB	SUBSTITUTE
SYNTAX	SYNTAX-MODE
TEKANM	ANSI/VT52-MODE

COMMANDS BY FUNCTION (cont)

Command Name	Description
DEBUGGING	
DECODE	DECODE
ENCODE	ENCODE
ERRORLEVEL	SET-ERROR-THRESHOLD
HELP	HELP
LOCAL	LOCAL
REPORT-ERRORS	REPORT-ERRORS
SNOOPY	SET-SNOOPY-MODE
STATUS	STATUS
Coax	
CUID	CUID
DBMEMORY	DBMEMORY
DBPORT	DBPORT
DBRECORDMODE	DBRECORDMODE
PLAY	PLAY
REPORTS	
ANSWERBACK	ANSWERBACK
DSR	DEVICE-STATUS-REPORT
ENQ	ENQUIRY
IDENTIFY	IDENTIFY
REOM	SET-REPORT-EOM-FREQUENCY
REPORT-4010-STATUS	REPORT-4010-STATUS
REPORT-TERMINAL-SETTINGS	REPORT-TERMINAL-SETTINGS
REPORTLENGTHS	SET-REPORT-LENGTHS
RLINELENGTH	SET-REPORT-MAX-LINE-LENGTH
RSIGCHARS	SET-REPORT-SIGNATURE-CHARACTERS
MACROS	
DECFUNCTIONKEYS	DECFUNCTIONKEYS
DECUDK	DEC-USER-DEFINED-KEYS
DEFINE	DEFINE-MACRO
EXPAND	EXPAND
KEYEXCHAR	SET-KEY-EXECUTE-CHARACTER
KEYEXPAND	ENABLE-KEY-EXPANSION
LEARN	LEARN
MACROSTATUS	MACROSTATUS
NVDEFINE	DEFINE-NONVOLATILE-MACRO
NVLEARN	NONVOLATILE-LEARN
TEKKEM	KEY-EXPANSION-MODE

COMMANDS BY FUNCTION (cont)

Command Name	Description
FILE SYSTEM	
COPY	COPY
DMAP	MAP-DEVICES
LOAD	LOAD
MUXSETTINGS	SET-MULTIPLEXER
PCOPY	PORT-COPY
PLOT	PLOT
REPORT-DEVICE-STATUS	REPORT-DEVICE-STATUS
SAVE	SAVE
HOST COMMUNICATIONS	
BAUDRATE	SET-BAUD-RATES
BREAKTIME	SET-BREAK-TIME
BYPASSCANCEL	SET-BYPASS-CANCEL-CHAR
C1TRANSMISSION	SELECT-C1-TRANSMISSION MODE
ECHO	SET-ECHO
ENTER-BYPASS-MODE	ENTER-BYPASS-MODE COMMAND
EOFSTRING	SET-EOF-STRING
EOLSTRING	SET-EOL-STRING
EOMCHARS	SET-EOM-CHARS
FLAGGING	SET-FLAGGING-MODE
PARITY	SET-PARITY
PROMPTMODE	PROMPT-MODE
PROMPTSTRING	SET-PROMPT-STRING
QUEUESIZE	SET-QUEUE-SIZE
SRM	SEND/RECEIVE-MODE
STOPBITS	SET-STOP-BITS
XMTDELAY	SET-TRANSMIT-DELAY
XMTLIMIT	SET-TRANSMIT-RATE-LIMIT

COMMANDS BY FUNCTION (cont)

Command Name	Description
LAN	
DMAP	
IBROADCAST	INTERNET-BROADCAST-MODE
IGATEADDRESS	INTERNET-GATEWAY-ADDRESS
IHOSTADDRESS	INTERNET-HOST-ADDRESS
ILANADDRESS	INTERNET-LAN-ADDRESS
ITERMADDRESS	INTERNET-TERMINAL-ADDRESS
LOADADDRESSES	LOAD-ADDRESSES
REPORT-NETWORK- SETTINGS	REPORT-NETWORK-SETTINGS
SAVEADDRESSES	SAVE-ADDRESSES
SET-TELNET-ATTRIBUTES	SET-TELNET-ATTRIBUTES
TCR	TELNET-CARRIAGE-RETURN
TDATA	TELNET-NETWORK-DATA-MODE
TESCAPE	TELNET-ESCAPE-CHARACTER
TLOCAL	TELNET-LOCAL-MODE
TPASSTHRU	TELNET-PASSTHRU-MODE
Coax	
HOSTPORT	HOST-PORT
PACING	PACING
TEKHEADER	TEK-HEADER-CHARACTER
TMETHOD	TRANSLATION-METHOD

COMMANDS BY FUNCTION (cont)

Command Name	Description
KEYBOARD	
AUTOREPEAT	See TEKARM
BEL	BELL
BELLTYPE	SET-BELL-TYPE
BELLVOLUME	SET-BELL-VOLUME
CLICK	CLICK
CURSORKEYMODE	See TEKCKM
CXKEYPAD	CX-KEYPAD
DMI	DISABLE-MANUAL-INPUT
EMI	ENABLE-MANUAL-INPUT
ENTER-ALTERNATE- KEYPAD-MODE	ENTER-ALTERNATE-KEYPAD-MODE
EXIT-ALTERNATE- KEYPAD-MODE	EXIT-ALTERNATE-KEYPAD-MODE
KAM	KEYBOARD-ACTION-MODE
KBDCHARSET	See SKCS
KEYMODE	SET-KEY-MODE
KEYPADMODE	See TEKKPAM, TEKKPNM
KEYUSEMODE	See TEKKBUM
LOCKKEYBOARD	LOCK-KEYBOARD
SKCS	SELECT-KEYBOARD-CHARACTER-SET
TEKARM	AUTOREPEAT-MODE
TEKCKM	CURSOR-KEYS-MODE
TEKKANAM	KATAKANA-SHIFT-MODE
TEKKBUM	KEYBOARD-USEAGE-MODE
TEKKKDM	KANJI-KATAKANA-DISPLAY-MODE
TEKKPAM	KEYPAD-APPLICATION-MODE
TEKKPNM	KEYPAD-NUMERIC-MODE
TEKNRCM	NATIONAL-REPLACEMENT- CHARACTER-SET-MODE

COMMANDS BY FUNCTION (cont)

Command Name	Description
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PERIPHERALS

AUTOPRINT	See MC
CONTROLLERMODE	See MC
DIM	DIM-ENABLE
MC	MEDIA-COPY
REPORT-COLORHARDCOPY-STATUS	REPORT-COLORHARDCOPY-STATUS
REPORT-PORT-STATUS	REPORT-PORT-STATUS
TEKPEX	PRINT-EXTENT-MODE
TEKPPF	PRINT-FORM-FEED-MODE

Hardcopy

4010-HARDCOPY	4010-HARDCOPY
HARDCOPY	HARDCOPY
HCBACKGROUND	BACKGROUND-COPY
HCCHARSETS	SELECT-HARDCOPY-CHARACTER-SETS
HCCOPIES	SET-NUMBER-OF-COPIES
HCDATTRIBUTES	SET-DIALOG-AREA-HARDCOPY-ATTRIBUTES
HCDATARES	SET-COLOR-COPIER-DATA-RESOLUTION
HCDENSITY	SELECT-COLOR-HARDCOPY-IMAGE-DENSITY
HCDITHER	SET-COLOR-HARDCOPY-DITHERING
HCFEATURES	SET-HARDCOPY-FEATURES
HCFORMWIDTH	SET-COLORHARDCOPY-FORM-WIDTH
HCINTERFACE	SELECT-HARDCOPY-INTERFACE
HCMAP	MAP-INDEX-TO-PRINT
HCMONOCHROME	SET-HARDCOPY-MONOCHROME-ATTRIBUTES
HCORIENT	SET-IMAGE-ORIENTATION
HCREPAINT	SET-COLOR-COPIER-REPAINT
HCRESERVE	RESERVE-COLOR-COPIER
HCSIZE	SET-COPY-SIZE
HCSTATISTICS	HARDCOPY-STATISTICS

2PPI

PASSIGN	PORT-ASSIGN
PBAUD	SET-PORT-BAUD-RATE
PBITS	SET-PORT-STOP-BITS
PCOPIES	SET-PORT-NUMBER-OF-COPIES
PEOF	SET-PORT-EOF-STRING
PFLAG	SET-PORT-FLAGGING-MODE
PINVERSION	SET-PORT-BLACK-WHITE-INVERSION
PMAP	MAP-INDEX-TO-PEN
PORIENT	SET-PORT-IMAGE-ORIENTATION
PPARITY	SET-PORT-PARITY
PQUEUE	SET-PORT-QUEUE-SIZE
PREPAINT	SET-PORT-COLOR-COPIER-REPAINT

COMMANDS BY FUNCTION (cont)

Command Name	Description
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COLORS AND SURFACES

CBACKGROUND	SET-BACKGROUND-COLOR
CMAP	SET-SURFACE-COLOR-MAP
CMODE	SET-COLOR-MODE
DACMAP	SET-DIALOG-AREA-COLOR-MAP
GBACKGROUND	SET-BACKGROUND-GRAY-LEVEL
GRAY	SET-SURFACE-GRAY-LEVELS
SDEFINITIONS	SET-SURFACE-DEFINITIONS
SPRIORITIES	SET-SURFACE-PRIORITIES
SVISIBILITY	SET-SURFACE-VISIBILITY

TEXT

ASIZEGROUP	SELECT-ALPHATEXT-SIZE-GROUP
BS	BACKSPACE
CHARSIZE	SET-CHARACTER-SIZE
CR	CARRIAGE-RETURN
CRLF	CRLF
DECDLD	DEC-DOWNLOAD-SOFT-CHARACTERS
ENTER-GRAPHICS-MODE	ENTER-GRAPHICS-MODE
EXIT-GRAPHICS-MODE	EXIT-GRAPHICS-MODE
FF	FORM-FEED
GTBEGIN	BEGIN-GRAPHTEXT-CHARACTER
GTDELETE	DELETE-GRAPHTEXT-CHARACTER
GTEND	END-GRAPHTEXT-CHARACTER
GTEXT	GRAPHIC-TEXT
GTFONT	SET-GRAPHTEXT-FONT
GTGRID	SET-GRAPHTEXT-FONT-GRID
HT	HORIZONTAL-TAB
LANGUAGETYPE	SELECT-LANGUAGE-TYPE
LF	LINE-FEED
LFCR	LFCR
LN	LINE-FEED/NEW-LINE-MODE
LS0	LOCKING-SHIFT-ZERO
LS1	LOCKING-SHIFT-ONE
LS1R	LOCKING-SHIFT-ONE-RIGHT
LS2	LOCKING-SHIFT-TWO
LS2R	LOCKING-SHIFT-TWO-RIGHT
LS3	LOCKING-SHIFT-THREE
LS3R	LOCKING-SHIFT-THREE-RIGHT
SELECT-CHARACTER-SET	SELECT-CHARACTER-SET
SET-4014-ALPHATEXT-SIZE	SET-4014-ALPHATEXT-SIZE
SET-ALPHATEXT-FONT	SET-ALPHATEXT-FONT
SS2	SINGLE-SHIFT-TWO
SS3	SINGLE-SHIFT-THREE
VT	VERTICAL-TAB

COMMANDS BY FUNCTION (cont)

Command Name	Description
DIALOG AREA	
ACURSOR	SET-ALPHA-CURSOR-INDICES
BASECOLOR	BASECOLOR
CAPITALS	CAPITALS
CLEARIALOG	CLEAR-DIALOG-SCROLL
CURSORTYPE	CURSORTYPE
DA2INDEX	SET-DIALOG-AREA-ALTERNATE-INDEX
DABUFFER	SET-DIALOG-AREA-BUFFER-SIZE
DACHARS	SET-DIALOG-AREA-CHARS
DADELETE	DELETE-DIALOG-AREA
DAENABLE	ENABLE-DIALOG-AREA
DAINDEX	SET-DIALOG-AREA-INDEX
DALINES	SET-DIALOG-AREA-LINES
DAMODE	SET-DIALOG-AREA-WRITING-MODE
DAPOSITION	SET-DIALOG-AREA-POSITION
DAVISIBILITY	SET-DIALOG-AREA-VISIBILITY
DAWIDTH	SET-DIALOG-AREA-BUFFER-WIDTH
TABS	SET-TAB-STOP

ANSI Syntax

AUTOWRAP	See TEKAWM
CBT	CURSOR-BACKWARD-TAB
CHT	CURSOR-FORWARD-TABULATION
COLUMNMODE	See TEKCOLM
CPR	ACTIVE-POSITION-REPORT
CUB	CURSOR-LEFT
CUD	CURSOR-DOWN
CUF	CURSOR-RIGHT
CUP	CURSOR-POSITION
CURSORENABLE	See TEKCEM
CUU	CURSOR-UP
DCH	DELETE-CHARACTER
DL	DELETE-LINE
ECH	ERASE-CHARACTER
ED	ERASE-IN-PAGE
EDITMARGINS	See TEKSTBM
EL	ERASE-IN-LINE
HTS	CHARACTER-TABULATION-SET
HTSA	HORIZONTAL-TAB-SET-ABSOLUTE
HVP	CHARACTER-AND-LINE-POSITION
ICH	INSERT-CHARACTER
IL	INSERT-LINE
IND	INDEX
IRM	INSERT/REPLACE-MODE
NEL	NEXT-LINE
ORIGINMODE	See TEKCOM
RI	REVERSE INDEX (RI)
RIS	RESET-TO-INITIAL-STATE
RM	RESET-MODE
SCREENMODE	See TEKSCNM

COMMANDS BY FUNCTION (cont)

Command Name	Description
ANSI Syntax (continued)	
SD	SCROLL-DOWN
SGR	SELECT-GRAPHIC-RENDITION
SL	SCROLL-LEFT
SM	SET-MODE
SR	SCROLL-RIGHT
SU	SCROLL-UP
TBC	TABULATION-CLEAR
TEKAWM	AUTOWRAP-MODE
TEKCOLM	COLUMN-MODE
TEKDHL	DOUBLE-HEIGHT-LINE
TEKDWL	DOUBLE-WIDTH-LINE
TEKOM	ORIGIN-MODE
TEKORM	OVERSTRIKE/REPLACE-MODE
TEKRC	RESTORE-CURSOR
TEKSC	SAVE-CURSOR
TEKSCA	SELECT-CHARACTER-ATTRIBUTES
TEKSCNM	SCREEN-MODE
TEKSTBM	SET-TOP-AND-BOTTOM-MARGINS
TEKSTR	SOFT-TERMINAL-RESET
TEKSWL	SINGLE-WIDTH-LINE
TEKTCM	TEXT-CURSOR-ENABLE-MODE
TEXTRENDITION	See SGR

VT52 Syntax

CURSOR-DOWN	CURSOR-DOWN
CURSOR-LEFT	CURSOR LEFT
CURSOR-RIGHT	CURSOR-RIGHT
CURSOR-TO-HOME	CURSOR-TO-HOME
CURSOR-UP	CURSOR-UP
DIRECT-CURSOR-ADDRESS	DIRECT-CURSOR-ADDRESS
ERASE-TO-END-OF-LINE	ERASE-TO-END-OF-LINE
ERASE-TO-END-OF-SCREEN	ERASE-TO-END-OF-SCREEN
REVERSE-LINE-FEED	REVERSE-LINE-FEED

PIXEL OPERATIONS

BEGINFILLPATTERN	BEGIN-FILL-PATTERN
ENDFILLPATTERN	END-FILL-PATTERN
PXBEGIN	BEGIN-PIXEL-OPERATIONS
PXCOPY	PIXEL-COPY
PXPOSITION	SET-PIXEL-BEAM-POSITION
PXRASTERWRITE	RASTER-WRITE
PXRECTANGLE	RECTANGLE-FILL
PXRESTORE	RESTORE-PIXELS-FROM-MEMORY
PXRUNLENGTHWRITE	RUNLENGTH-WRITE
PXSAVE	SAVE-PIXELS-TO-MEMORY
PXVIEWPORT	SET-PIXEL-VIEWPORT
PXZOOM	PIXEL-ZOOM

COMMANDS BY FUNCTION (cont)

Command Name	Description
VIEW ENVIRONMENT	
BORDER	SET-BORDER-VISIBILITY
LOCKVIEWINGKEYS	LOCK-VIEWING-KEYS
OVERWINDOW	SET-OVERVIEW-WINDOW
PAGE	PAGE
RENEW	RENEW-VIEW
VATTRIBUTES	SET-VIEW-ATTRIBUTES
VCLUSTER	SET-VIEW-DISPLAY-CLUSTER
VDELETE	DELETE-VIEW
VIEWPORT	SET-VIEWPORT
VSELECT	SELECT-VIEW
WINDOW	SET-WINDOW

GRAPHICS PRIMITIVES

BACKINDICES	SET-BACKGROUND-INDICES
BEGINPANEL	BEGIN-PANEL-BOUNDARY
BOUNDARY	SET-DRAW-BOUNDARY-MODE
CSMOOTH	SET-CURVE-SMOOTHNESS
CURVE	DRAW-CURVE
DMARKER	DEFINE-MARKER
DRAW	DRAW
ENDPANEL	END-PANEL
FILLPATTERN	SELECT-FILL-PATTERN
GAMODE	SET-GRAPHICS-AREA-WRITING-MODE
GTINDEX	SET-TEXT-INDEX
GTPATH	SET-GRAPHTEXT-CHARACTER-PATH
GTPRECISION	SET-GRAPHTEXT-PRECISION
GTROTATION	SET-GRAPHTEXT-ROTATION
GTSIZE	SET-GRAPHTEXT-SIZE
GTSLANT	SET-GRAPHTEXT-SLANT
LINEINDEX	SET-LINE-INDEX
LINESTYLE	SET-LINE-STYLE
MARKER	DRAW-MARKER
MARKERTYPE	SET-MARKER-TYPE
MOVE	MOVE
PANELFILL	SET-PANEL-FILLING-MODE
PDRAW	POLYDRAW
PMARKER	POLYMARKER
RECTANGLE	DRAW-RECTANGLE
SET-4014-LINE-STYLE	SET-4014-LINE-STYLE

COMMANDS BY FUNCTION (cont)

Command Name	Description
SEGMENTS	
FIXUP	SET-FIXUP-LEVEL
REPORT-SEGMENT-STATUS	REPORT-SEGMENT-STATUS
SGCALL	CALL-SEGMENT
SGCLASS	SET-SEGMENT-CLASS
SGCLOSE	END-SEGMENT
SGDELETE	DELETE-SEGMENT
SGDETECT	SET-SEGMENT-DETECTABILITY
SGDOWN	BEGIN-LOWER-SEGMENT
SGEDIT	SET-SEGMENT-EDIT-MODE
SGHIGHLIGHT	SET-SEGMENT-HIGHLIGHTING
SGINCLUDE	INCLUDE-COPY-OF-SEGMENT
SGINSERT	INSERT-INTO-SEGMENT
SGMATCHINGCLASS	SET-CURRENT-MATCHING-CLASS
SGMODE	SET-SEGMENT-WRITING-MODE
SGNEW	BEGIN-NEW-SEGMENT
SGOPEN	BEGIN-SEGMENT
SGPICKID	SET-PICK-ID
SGPIVOT	SET-PIVOT-POINT
SGPOSITION	SET-SEGMENT-POSITION
SGPRIORITY	SET-SEGMENT-DISPLAY-PRIORITY
SGREMOVE	DELETE-PART-OF-SEGMENT
SGRENAME	RENAME-SEGMENT
SGREPLACE	REPLACE-PART-OF-SEGMENT
SGSCALEROTATE	SET-SEGMENT-SCALE-ROTATION
SGTRANSFORM	SET-SEGMENT-IMAGE-TRANSFORM
SGUP	BEGIN-HIGHER-SEGMENT
SGVISIBILITY	SET-SEGMENT-VISIBILITY

GRAPHIC INPUT

ENABLE-4010-GIN	ENABLE-4010-GIN
GINAREA	SET-GIN-AREA
GINCURSOR	SET-GIN-CURSOR
GINDISABLE	DISABLE-GIN
GINENABLE	ENABLE-GIN
GINFILTER	SET-GIN-STROKE-FILTERING
GINFORMAT	SET-GIN-REPORT-FORMAT
GINGRIDDING	SET-GIN-GRIDDING
GININKING	SET-GIN-INKING
GINMAPDEVICE	MAP-GIN-DEVICE
GINPICKAPERTURE	SET-PICK-APERTURE
GINRATES	SET-GIN-RATES
GINRUBBERBAND	SET-GIN-RUBBERBANDING
GINSTARTPOINT	SET-GIN-DISPLAY-START-POINT
GINWINDOW	SET-GIN-WINDOW
GSPEED	SET-GIN-CURSOR-SPEED
MOUSEMAP	MAP-MOUSE-TO-CURSOR-PAD
REPORT-GIN-POINT	REPORT-GIN-POINT
TBSIZE	SET-TABLET-SIZE

COMMANDS BY DESCRIPTION

Description	Command Name
4010-HARDCOPY	4010-HARDCOPY
ACTIVE-POSITION-REPORT	CPR
ANSI/VT52-MODE	TEKANM
ANSWERBACK	ANSWERBACK
APPLICATION-PROGRAM-COMMAND	APC
AUTOREPEAT-MODE	TEKARM
AUTOWRAP-MODE	TEKAWM
BACKGROUND-COPY	HCBACKGROUND
BACKSPACE	BS
BASECOLOR	BASECOLOR
BEGIN-FILL-PATTERN	BEGINFILLPATTERN
BEGIN-GRAPHTEXT-CHARACTER	GTBEGIN
BEGIN-HIGHER-SEGMENT	SGUP
BEGIN-LOWER-SEGMENT	SGDOWN
BEGIN-NEW-SEGMENT	SGNEW
BEGIN-PANEL-BOUNDARY	BEGINPANEL
BEGIN-PIXEL-OPERATIONS	PXBEGIN
BEGIN-SEGMENT	SGOPEN
BELL	BEL
CALL-SEGMENT	SGCALL
CANCEL	CAN
CANCEL COMMAND	CANCEL
CAPITALS	CAPITALS
CARRIAGE-RETURN	CR
CHARACTER-AND-LINE-POSITION	HVP
CHARACTER-TABULATION-SET	HTS
CLEAR-DIALOG-SCROLL	CLEARDIALOG
CLICK	CLICK
COLUMN-MODE	TEKCOLM
CONTROL-SEQUENCE-INTRODUCER	CSI
COPY	COPY
CRLF	CRLF
CUID	CUID
CURSOR LEFT	CURSOR-LEFT
CURSOR-BACKWARD-TAB	CBT
CURSOR-DOWN	CURSOR-DOWN
CURSOR-FORWARD-TABULATION	CHT
CURSOR-KEYS-MODE	TEKCKM
CURSOR-LEFT	CUB
CURSOR-POSITION	CUP
CURSOR-RIGHT	CUF
CURSOR-TO-HOME	CURSOR-TO-HOME
CURSOR-UP	CUU
CURSORTYPE	CURSORTYPE
CX-KEYPAD	CXKEYPAD
DBMEMORY	DBMEMORY
DBPORT	DBPORT
DBRECORDMODE	DBRECORDMODE
DEC-USER-DEFINED-KEYS	DECUDK
DEC-DOWNLOAD-SOFT-CHARACTERS	DECULD

COMMANDS BY DESCRIPTION (cont)

Description	Command Name
DECFUNCTIONKEYS	DECFUNCTIONKEYS
DECODE	DECODE
DECTERMINAL	DECTERMINAL
DEFINE-MACRO	DEFINE
DEFINE-MARKER	DMARKER
DEFINE-NONVOLATILE-MACRO	NVDEFINE
DELETE	DT
DELETE-CHARACTER	DCH
DELETE-DIALOG-AREA	DADELETE
DELETE-GRAPHTEXT-CHARACTER	GTDELETE
DELETE-LINE	DL
DELETE-PART-OF-SEGMENT	SGREMOVE
DELETE-SEGMENT	SGDELETE
DELETE-VIEW	VDELETE
DEVICE-ATTRIBUTES	DA
DEVICE-CONTROL-STRING-INTRODUCER	DCS
DEVICE-STATUS-REPORT	DSR
DIM-ENABLE	DIM
DIRECT-CURSOR-ADDRESS	DIRECT-CURSOR-ADDRESS
DISABLE-GIN	GINDISABLE
DISABLE-MANUAL-INPUT	DMI
DISPLAY-ALPHATEXT	DISPLAY-ALPHATEXT
DOUBLE-HEIGHT-LINE	TEKDHL
DOUBLE-WIDTH-LINE	TEKDWL
DRAW	DRAW
DRAW-CURVE	CURVE
DRAW-MARKER	MARKER
DRAW-RECTANGLE	RECTANGLE
ENABLE-4010-GIN	ENABLE-4010-GIN
ENABLE-DIALOG-AREA	DAENABLE
ENABLE-GIN	GINENABLE
ENABLE-KEY-EXPANSION	KEYEXPAND
ENABLE-MANUAL-INPUT	EMI
ENCODE	ENCODE
END-FILL-PATTERN	ENDFILLPATTERN
END-GRAPHTEXT-CHARACTER	GTEND
END-PANEL	ENDPANEL
END-SEGMENT	SGCLOSE
ENQUIRY	ENQ
ENTER-ALPHA-MODE	ENTER-ALPHA-MODE
ENTER-ALTERNATE-KEYPAD-MODE	ENTER-ALTERNATE-KEYPAD-MODE
ENTER-ANSI-MODE	ENTER-ANSI-MODE
ENTER-BYPASS-MODE	ENTER-BYPASS-MODE
ENTER-GRAPHICS-MODE	ENTER-GRAPHICS-MODE
ENTER-MARKER-MODE	ENTER-MARKER-MODE
ENTER-VECTOR-MODE	ENTER-VECTOR-MODE
ERASE-CHARACTER	ECH

COMMANDS BY DESCRIPTION (cont)

Description	Command Name
ERASE-IN-LINE	EL
ERASE-IN-PAGE	ED
ERASE-TO-END-OF-LINE	ERASE-TO-END-OF-LINE
ERASE-TO-END-OF-SCREEN	ERASE-TO-END-OF-SCREEN
EXIT-ALTERNATE-KEYPAD-MODE	EXIT-ALTERNATE-KEYPAD-MODE
EXIT-GRAPHICS-MODE	EXIT-GRAPHICS-MODE
EXPAND	EXPAND
FACTORY	FACTORY
FORM-FEED	FF
GRAPHIC-TEXT	GTEXT
GRAPHICS-RESOLUTION	GRESOLUTION
HARDCOPY	HARDCOPY
HARDCOPY-STATISTICS	HCSTATISTICS
HELP	HELP
HORIZONTAL-TAB	HT
HORIZONTAL-TAB-SET-ABSOLUTE	HTSA
HOST-PORT	HOSTPORT
IDENTIFY	IDENTIFY
IDENTIFY-TERMINAL	TEKID
IGNORE-DELETES	IGNOREDEL
INCLUDE-COPY-OF-SEGMENT	SGINCLUDE
INDEX	IND
INSERT-CHARACTER	ICH
INSERT-INTO-SEGMENT	SGINSERT
INSERT-LINE	IL
INSERT/REPLACE-MODE	IRM
INTERNET-BROADCAST-MODE	IBROADCAST
INTERNET-GATEWAY-ADDRESS	IGATEADDRESS
INTERNET-HOST-ADDRESS	IHOSTADDRESS
INTERNET-LAN-ADDRESS	ILANADDRESS
INTERNET-TERMINAL-ADDRESS	ITERMADDRESS
KANJI-KATAKANA-DISPLAY-MODE	TEKKKDM
KATAKANA-SHIFT-MODE	TEKKANAM
KEY-EXPANSION-MODE	TEKKEM
KEYBOARD-ACTION-MODE	KAM
KEYBOARD-USEAGE-MODE	TEKKBUM
KEYPAD-APPLICATION-MODE	TEKKPAM
KEYPAD-NUMERIC-MODE	TEKKPNM
LEARN	LEARN
LFCR	LFCR
LINE-FEED	LF
LINE-FEED/NEW-LINE-MODE	LNM
LOAD	LOAD
LOAD-ADDRESSES	LOADADDRESSES
LOCAL	LOCAL
LOCK-KEYBOARD	LOCKKEYBOARD
LOCK-VIEWING-KEYS	LOCKVIEWINGKEYS
LOCKING-SHIFT-ONE	LS1
LOCKING-SHIFT-ONE-RIGHT	LS1R

COMMANDS BY DESCRIPTION (cont)

Description	Command Name
LOCKING-SHIFT-THREE	LS3
LOCKING-SHIFT-THREE-RIGHT	LS3R
LOCKING-SHIFT-TWO	LS2
LOCKING-SHIFT-TWO-RIGHT	LS2R
LOCKING-SHIFT-ZERO	LS0
MACROSTATUS	MACROSTATUS
MAP-DEVICES	DMAP
MAP-GIN-DEVICE	GINMAPDEVICE
MAP-INDEX-TO-PEN	PMAP
MAP-INDEX-TO-PRINT	HCMAP
MAP-MOUSE-TO-CURSOR-PAD	MOUSEMAP
MEDIA-COPY	MC
MOVE	MOVE
NATIONAL-REPLACEMENT-CHARACTER-SET-MODE	TEKNRCM
NEXT-LINE	NEL
NONVOLATILE-LEARN	NVLEARN
NULL	NUL
OPERATING-SYSTEM-COMMAND	OSC
ORIGIN-MODE	TEKOM
OVERSTRIKE/REPLACE-MODE	TEKORM
PACING	PACING
PAGE	PAGE
PIXEL-COPY	PXCOPY
PIXEL-ZOOM	PXZOOM
PLAY	PLAY
PLOT	PLOT
POLYDRAW	PDRAW
POLYMARKER	PMARKER
PORT-ASSIGN	PASSIGN
PORT-COPY	PCOPY
PRINT-EXTENT-MODE	TEKPEX
PRINT-FORM-FEED-MODE	TEKPFF
PRIVACY-MESSAGE	PM
PROMPT-MODE	PROMPTMODE
RASTER-WRITE	PXRASTERWRITE
RECTANGLE-FILL	PXRECTANGLE
RENAME-SEGMENT	SGRENAME
RENEW-VIEW	RENEW
REPLACE-PART-OF-SEGMENT	SGREPLACE
REPORT-4010-STATUS	REPORT-4010-STATUS
REPORT-COLORHARDCOPY-STATUS	REPORT-COLORHARDCOPY-STATUS
REPORT-DEVICE-STATUS	REPORT-DEVICE-STATUS
REPORT-ERRORS	REPORT-ERRORS
REPORT-GIN-POINT	REPORT-GIN-POINT
REPORT-NETWORK-SETTINGS	REPORT-NETWORK-SETTINGS
REPORT-PORT-STATUS	REPORT-PORT-STATUS

COMMANDS BY DESCRIPTION (cont)

Description	Command Name
REPORT-SEGMENT-STATUS	REPORT-SEGMENT-STATUS
REPORT-TERMINAL-SETTINGS	REPORT-TERMINAL-SETTINGS
RESERVE-COLOR-COPIER	HCRESERVE
RESET	RESET
RESET-MODE	RM
RESET-TO-INITIAL-STATE	RIS
RESTORE-CURSOR	TEKRC
RESTORE-PIXELS-FROM-MEMORY	PXRESTORE
REVERSE INDEX (RI)	RI
REVERSE-LINE-FEED	REVERSE-LINE-FEED
RUNLENGTH-WRITE	PXRUNLENGTHWRITE
SAVE	SAVE
SAVE-ADDRESSES	SAVEADDRESSES
SAVE-CURSOR	TEKSC
SAVE-ENVIRONMENT	TEKSE
SAVE-NONVOLATILE-PARAMETERS	NVSAVE
SAVE-PIXELS-TO-MEMORY	PXSAVE
SCREEN-MODE	TEKSCNM
SCROLL-DOWN	SD
SCROLL-LEFT	SL
SCROLL-RIGHT	SR
SCROLL-UP	SU
SELECT-ALPHATEXT-SIZE-GROUP	ASIZEGROUP
SELECT-C1-TRANSMISSION MODE	C1TRANSMISSION
SELECT-CHARACTER-ATTRIBUTES	TEKSCA
SELECT-CHARACTER-SET	SELECT-CHARACTER-SET
SELECT-CODE	CODE
SELECT-COLOR-HARDCOPY-IMAGE-DENSITY	HCDENSITY
SELECT-FILL-PATTERN	FILLPATTERN
SELECT-GRAPHIC-RENDITION	SGR
SELECT-HARDCOPY-CHARACTER-SETS	HCCHARSETS
SELECT-HARDCOPY-INTERFACE	HCINTERFACE
SELECT-KEYBOARD-CHARACTER-SET	SKCS
SELECT-LANGUAGE-TYPE	LANGUAGE TYPE
SELECT-VIEW	VSELECT
SEND/RECEIVE-MODE	SRM
SET-4014-ALPHATEXT-SIZE	SET-4014-ALPHATEXT-SIZE
SET-4014-LINE-STYLE	SET-4014-LINE-STYLE
SET-ALPHA-CURSOR-INDICES	ACURSOR
SET-ALPHATEXT-FONT	SET-ALPHATEXT-FONT
SET-BACKGROUND-COLOR	CBACKGROUND
SET-BACKGROUND-GRAY-LEVEL	GBACKGROUND
SET-BACKGROUND-INDICES	BACKINDICES
SET-BAUD-RATES	BAUDRATE
SET-BELL-TYPE	BELLTYPE
SET-BELL-VOLUME	BELLVOLUME

COMMANDS BY DESCRIPTION (cont)

Description	Command Name
SET-BORDER-VISIBILITY	BORDER
SET-BREAK-TIME	BREKTIME
SET-BYPASS-CANCEL-CHAR	BYPASSCANCEL
SET-CHARACTER-SIZE	CHARSIZE
SET-COLOR-COPIER-DATA-RESOLUTION	HCDATARES
SET-COLOR-COPIER-REPAINT	HCREPAINT
SET-COLOR-HARDCOPY-DITHERING	HCDITHER
SET-COLOR-MODE	CMODE
SET-COLORHARDCOPY-FORM-WIDTH	HCFORMWIDTH
SET-COMPATIBILITY-LEVEL	TEKSC
SET-COORDINATE-MODE	COORDINATEMODE
SET-COPY-SIZE	HCSIZE
SET-CURRENT-MATCHING-CLASS	SGMATCHINGCLASS
SET-CURVE-SMOOTHNESS	CSMOOTH
SET-DIALOG-AREA-ALTERNATE-INDEX	DA2INDEX
SET-DIALOG-AREA-BUFFER-SIZE	DABUFFER
SET-DIALOG-AREA-BUFFER-WIDTH	DAWIDTH
SET-DIALOG-AREA-CHARS	DACHARS
SET-DIALOG-AREA-COLOR-MAP	DACMAP
SET-DIALOG-AREA-HARDCOPY-ATTRIBUTES	HCDAATTRIBUTES
SET-DIALOG-AREA-INDEX	DAINDEX
SET-DIALOG-AREA-LINES	DALINES
SET-DIALOG-AREA-POSITION	DAPOSITION
SET-DIALOG-AREA-VISIBILITY	DAVISIBILITY
SET-DIALOG-AREA-WRITING-MODE	DAMODE
SET-DRAW-BOUNDARY-MODE	BOUNDARY
SET-ECHO	ECHO
SET-EDIT-CHARS	EDITCHARS
SET-EOF-STRING	EOFSTRING
SET-EOL-STRING	EOLSTRING
SET-EOM-CHARS	EOMCHARS
SET-ERROR-THRESHOLD	ERRORLEVEL
SET-FIXUP-LEVEL	FIXUP
SET-FLAGGING-MODE	FLAGGING
SET-GIN-AREA	GINAREA
SET-GIN-CURSOR	GINCURSOR
SET-GIN-CURSOR-SPEED	GSPEED
SET-GIN-DISPLAY-START-POINT	GINSTARTPOINT
SET-GIN-GRIDDING	GINGRIDDING
SET-GIN-INKING	GININKING
SET-GIN-RATES	GINRATES
SET-GIN-REPORT-FORMAT	GINFORMAT
SET-GIN-RUBBERBANDING	GINRUBBERBAND
SET-GIN-STROKE-FILTERING	GINFILTER
SET-GIN-WINDOW	GINWINDOW
SET-GRAPHICS-AREA-WRITING-MODE	GAMODE

COMMANDS BY DESCRIPTION (cont)

Description	Command Name
SET-GRAPHTEXT-CHARACTER-PATH	GTPATH
SET-GRAPHTEXT-FONT	GTFONT
SET-GRAPHTEXT-FONT-GRID	GTGRID
SET-GRAPHTEXT-PRECISION	GTPRECISION
SET-GRAPHTEXT-ROTATION	GTROTATION
SET-GRAPHTEXT-SIZE	GTSIZE
SET-GRAPHTEXT-SLANT	GTSLANT
SET-HARDCOPY-FEATURES	HCFEATURES
SET-HARDCOPY-MONOCHROME-ATTRIBUTES	HCMONOCHROME
SET-IMAGE-ORIENTATION	HCORIENT
SET-KEY-EXECUTE-CHARACTER	KEYEXCHAR
SET-KEY-MODE	KEYMODE
SET-LINE-INDEX	LINEINDEX
SET-LINE-STYLE	LINESTYLE
SET-MARKER-TYPE	MARKERTYPE
SET-MODE	SM
SET-MULTIPLEXER	MUXSETTINGS
SET-NET-ADDRESSES	SET-NET-ADDRESSES
SET-NUMBER-OF-COPIES	HCCOPIES
SET-OVERVIEW-WINDOW	OVERWINDOW
SET-PANEL-FILLING-MODE	PANELFILL
SET-PARITY	PARITY
SET-PICK-APERTURE	GINPICKAPERTURE
SET-PICK-ID	SGPICKID
SET-PIVOT-POINT	SGPIVOT
SET-PIXEL-BEAM-POSITION	PXPOSITION
SET-PIXEL-VIEWPORT	PXVIEWPORT
SET-PORT-BAUD-RATE	PBAUD
SET-PORT-BLACK-WHITE-INVERSION	PINVERSION
SET-PORT-COLOR-COPIER-REPAINT	PREPAINT
SET-PORT-EOF-STRING	PEOF
SET-PORT-FLAGGING-MODE	PFLAG
SET-PORT-IMAGE-ORIENTATION	PORIENT
SET-PORT-NUMBER-OF-COPIES	PCOPIES
SET-PORT-PARITY	PPARITY
SET-PORT-QUEUE-SIZE	PQUEUE
SET-PORT-STOP-BITS	PBITS
SET-PROMPT-STRING	PROMPTSTRING
SET-QUEUE-SIZE	QUEUESIZE
SET-REPORT-EOM-FREQUENCY	REOM
SET-REPORT-LENGTHS	REPORT-LENGTHS
SET-REPORT-MAX-LINE-LENGTH	RLINELENGTH
SET-REPORT-SIGNATURE-CHARACTERS	RSIGCHARS
SET-SEGMENT-CLASS	SGCLASS
SET-SEGMENT-DETECTABILITY	SGDETECT
SET-SEGMENT-DISPLAY-PRIORITY	SGPRIORITY

COMMANDS BY DESCRIPTION (cont)

Description	Command Name
SET-SEGMENT-EDIT-MODE	SGEDIT
SET-SEGMENT-HIGHLIGHTING	SGHIGHLIGHT
SET-SEGMENT-IMAGE-TRANSFORM	SGTRANSFORM
SET-SEGMENT-POSITION	SGPOSITION
SET-SEGMENT-SCALE-ROTATION	SGSCALEROTATE
SET-SEGMENT-VISIBILITY	SGVISIBILITY
SET-SEGMENT-WRITING-MODE	SGMODE
SET-SNOOPY-MODE	SNOOPY
SET-STOP-BITS	STOPBITS
SET-SURFACE-COLOR-MAP	CMAP
SET-SURFACE-DEFINITIONS	SDEFINITIONS
SET-SURFACE-GRAY-LEVELS	GRAY
SET-SURFACE-PRIORITIES	SPRIORITIES
SET-SURFACE-VISIBILITY	SVISIBILITY
SET-TAB-STOPS	TABS
SET-TABLET-SIZE	TBSIZE
SET-TELNET-ATTRIBUTES	SET-TELNET-ATTRIBUTES
SET-TERMINAL-MODEL	TERMINAL
SET-TEXT-INDEX	GTINDEX
SET-TOP-AND-BOTTOM-MARGINS	TEKSTBM
SET-TRANSMIT-DELAY	XMTDELAY
SET-TRANSMIT-RATE-LIMIT	XMTLIMIT
SET-VIEW-ATTRIBUTES	VATTRIBUTES
SET-VIEW-DISPLAY-CLUSTER	VCLUSTER
SET-VIEWPORT	VIEWPORT
SET-WINDOW	WINDOW
SINGLE-SHIFT-THREE	SS3
SINGLE-SHIFT-TWO	SS2
SINGLE-WIDTH-LINE	TEKSWL
SOFT-TERMINAL-RESET	TEKSTR
STATUS	STATUS
STRING-TERMINATOR	ST
SUBSTITUTE	SUB
SYNTAX-MODE	SYNTAX
TABULATION-CLEAR	TBC
TEK-HEADER-CHARACTER	TEKHEADER
TELNET-CARRIAGE-RETURN	TCR
TELNET-ESCAPE-CHARACTER	TESCAPE
TELNET-LOCAL-MODE	TLOCAL
TELNET-PASSTHRU-MODE	TPASSTHRU
TEXT-CURSOR-ENABLE-MODE	TEKTCM
TRANSLATION-METHOD	TMETHOD
VERTICAL-TAB	VT

Command Summary

COMMANDS BY OPCODE

The opcodes are listed according to the ADE (ASCII decimal equivalent) values of each character in the printed representation, with lowest values first. Thus, D_T comes before E_C , and $E_C\#$ before $E_C\%$.

OpCode	Command Name
B_L	BEL
B_S	BS
C_N	CAN
C_R	CR
D_T	DT
$E_C\#!$	SYNTAX
$E_C\#\%$	TEKSE
$E_C\#\&$	SKCS
$E_C\#(0)$	LANGUAGETYPE (EUROPEAN)
$E_C\#(1)$	LANGUAGETYPE (JISKANJI) ^a
$E_C\#(2)$	LANGUAGETYPE (UNIXKANJI) ^a
$E_C\#(3)$	LANGUAGETYPE (DECKANJI) ^a
$E_C\#3$	TEKDHL
$E_C\#5$	TEKSWL
$E_C\#6$	TEKDWL
$E_C\#S_P$	CODE
$E_C\#\%$	CODE
$E_C($	SELECT-CHARACTER-SET
$E_C)$	SELECT-CHARACTER-SET
E_C*	SELECT-CHARACTER-SET
E_C+	SELECT-CHARACTER-SET
E_C	SELECT-CHARACTER-SET
$E_C.$	SELECT-CHARACTER-SET
$E_C/$	SELECT-CHARACTER-SET
E_C7	TEKSC
E_C8	TEKRC
E_C8	SET-4014-ALPHATEXT-SIZE
E_C9	SET-4014-ALPHATEXT-SIZE
$E_C:$	SET-4014-ALPHATEXT-SIZE
$E_C;$	SET-4014-ALPHATEXT-SIZE
$E_C<$	ENTER-ANSI-MODE
$E_C=$	TEKKPAM
$E_C>$	TEKKPNM
$E_C>$	EXIT-ALTERNATE-KEYPAD-MODE
E_CA	CURSOR-UP
E_CB	CURSOR-DOWN
E_CC	CURSOR-RIGHT
E_CD	IND
E_CE	NEL
E_CF	ENTER-GRAPHICS-MODE
E_CG	EXIT-GRAPHICS-MODE

^a Requires Sony/Tek Option 4L.

COMMANDS BY OPCODE (cont)

OpCode	Command Name
E_{cH}	CURSOR-TO-HOME
E_{cH}	HTS
E_{cI}	REVERSE-LINE-FEED
E_{cIA}	GINPICKAPERTURE
E_{cIB}	GINMAPDEVICE
E_{cIC}	GINCURSOR
E_{cID}	GINDISABLE
E_{cIE}	GINENABLE
E_{cIF}	GINFILTER
E_{cIG}	GINGRIDDING
E_{cII}	GININKING
E_{cIJ}	GSPEED
E_{cIK}	GINFORMAT
E_{cIL}	RLINELENGTH
E_{cIM}	REOM
E_{cIN}	TBSIZE
E_{cIP}	REPORT-GIN-POINT
E_{cIQ}	REPORT-TERMINAL-SETTINGS
E_{cIR}	GINRUBBERBAND
E_{cIS}	RSIGCHARS
E_{cIU}	GINRATES
E_{cIV}	GINAREA
E_{cIW}	GINWINDOW
E_{cIX}	GINSTARTPOINT
E_{cJ}	ERASE-TO-END-OF-SCREEN
E_{cJC}	COPY
E_{cJG}	REPORTLENGTHS
E_{cJL}	LOAD
E_{cJM}	DMAP
E_{cJQ}	REPORT-DEVICE-STATUS
E_{cJV}	SAVE
E_{cK}	ERASE-TO-END-OF-LINE
E_{cKA}	DAENABLE
E_{cKB}	TABS
E_{cKC}	CANCEL
E_{cKD}	DEFINE
E_{cKE}	ECHO
E_{cKF}	LFGR
E_{cKG}	DIM
E_{cKH}	HARDCOPY
E_{cKI}	IGNOREDEL
E_{cKJ}	KEYMODE
E_{cKK}	DADELETE
E_{cKL}	LOCKKEYBOARD
E_{cKN}	RENEW
E_{cKO}	NVDEFINE
E_{cKQ}	REPORT-ERRORS
E_{cKR}	CRLF
E_{cKS}	SNOOPY
E_{cKT}	ERRORLEVEL

COMMANDS BY OPCODE (cont)

OpCode	Command Name
E _c KU	NVSAVE
E _c KV	RESET
E _c KW	KEYEXPAND
E _c KX	EXPAND
E _c KY	KEYEXCHAR
E _c KZ	EDITCHARS
E _c LB	DABUFFER
E _c LC	DACHARS
E _c LD	PDRAW
E _c LE	ENDPANEL
E _c LF	MOVE
E _c LG	DRAW
E _c LH	MARKER
E _c LI	DAINDEX
E _c LJ	DAZINDEX
E _c LK	SGINCLUDE
E _c LL	DALINES
E _c LM	DAMODE
E _c LP	BEGINPANEL
E _c LR	PMARKER
E _c LT	GTEXT
E _c LV	DAVISIBILITY
E _c LW	DAWIDTH
E _c LX	DAPOSITION
E _c LZ	CLEARIALOG
E _c M	RI
E _c MA	GTSBLANT
E _c MB	BACKINDEX
E _c MC	GTSIZE
E _c MD	BEGINFILLPATTERN
E _c ME	ENDFILLPATTERN
E _c MF	GTFONT
E _c MG	GAMODE
E _c MI	SGPICKID
E _c ML	LINEINDEX
E _c MM	MARKERTYPE
E _c MN	GTPATH
E _c MP	FILLPATTERN
E _c MQ	GTPRECISION
E _c MR	GTROTATION
E _c MS	PANSELFILL
E _c MT	GTINDEX
E _c MU	CHARSIZE
E _c MV	LINESTYLE
E _c MY	ASIZEGROUP
E _c N	SS2
E _c NB	STOPBITS
E _c NC	EOMCHARS
E _c ND	XMTDELAY
E _c NE	EOFSTRING

COMMANDS BY OPCODE (cont)

OpCode	Command Name
E _c NF	FLAGGING
E _c NK	BREAKTIME
E _c NL	XMTLIMIT
E _c NM	PROMPTMODE
E _c NP	PARITY
E _c NQ	QUEUESIZE
E _c NR	BAUDRATE
E _c NS	PROMPTSTRING
E _c NT	EOLSTRING
E _c NU	BYPASSCANCEL
E _c NX	MUXSETTINGS
E _c O	SS3
E _c OI	TEKHEADER
E _c OQ	REPORT-NETWORK-SETTINGS
E _c OV	SET-TELNET-ATTRIBUTES
E _c OX	SET-NET-ADDRESSES
E _c P	DCS
E _c P...{...E _c \	DECDLD
E _c P...!...E _c \	DECUDK
E _c PA	PASSIGN
E _c PB	PBITS
E _c PC	PCOPY
E _c PE	PEOF
E _c PF	PFLAG
E _c PI	PMAP
E _c PJ	PINVERSION
E _c PL	PLOT
E _c PN	PCOPIES
E _c PO	PORIENT
E _c PP	PPARITY
E _c PQ	REPORT-PORT-STATUS
E _c PR	PBAUD
E _c PS	PQUEUE
E _c PT	PREPAINT
E _c QA	HCSIZE
E _c QB	HCDATAES
E _c QD	HCINTERFACE
E _c QE	HCMONOCROME
E _c QF	HCFORMWIDTH
E _c QI	HCMAP
E _c QK	HCCHARSETS
E _c QL	HCDATTRIBUTES
E _c QM	HCDITHER
E _c QN	HCCOPIES
E _c QO	HCORIENT
E _c QQ	REPORT-COLORHARDCOPY-STATUS
E _c QR	HCRESERVE
E _c QT	HCREPAINT
E _c QU	HCDENSITY
E _c QX	HCFEATURES

COMMANDS BY OPCODE (cont)

OpCode	Command Name
^E cRA	VATTRIBUTES
^E cRB	GBACKGROUND
^E cRC	VSELECT
^E cRD	SDEFINITIONS
^E cRE	BORDER
^E cRF	FIXUP
^E cRG	GRAY
^E cRH	PXPOSITION
^E cRI	SVISIBILITY
^E cRJ	LOCKVIEWINGKEYS
^E cRK	VDELETE
^E cRL	PXRUNLENGTHWRITE
^E cRM	DMARKER
^E cRN	SPRIORITIES
^E cRP	PXRASTERWRITE
^E cRQ	VCLUSTER
^E cRR	PXRECTANGLE
^E cRS	PXVIEWPORT
^E cRU	PXBEGIN
^E cRV	VIEWPORT
^E cRW	WINDOW
^E cRX	PXCOPY
^E cSA	SGCLASS
^E cSB	SGDOWN
^E cSC	SGCLOSE
^E cSD	SGDETECT
^E cSE	SGNEW
^E cSF	SGCALL
^E cSG	GTGRID
^E cSH	SGHIGHLIGHT
^E cSI	SGTRANSFORM
^E cSJ	SGSCALEROTATE
^E cSK	SGDELETE
^E cSL	SGMATCHINGCLASS
^E cSM	SGMODE
^E cSN	SGUP
^E cSO	SGOPEN
^E cSP	SGPIVOT
^E cSQ	REPORT-SEGMENT-STATUS
^E cSR	SGRENAME
^E cSS	SGPRIORITY
^E cST	GTBEGIN
^E cSU	GTEND
^E cSV	SGVISIBILITY
^E cSX	SGPOSITION
^E cSZ	GTDELETE
^E cTB	CBACKGROUND
^E CTD	ACURSOR
^E CTF	DACMAP
^E CTG	CMAP

COMMANDS BY OPCODE (cont)

OpCode	Command Name
^E cTM	CMODE
^E cUB	BOUNDARY
^E cUC	CURVE
^E cUD	SGREMOVE
^E cUE	SGREPLACE
^E cUG	CSMOOTH
^E cUH	SGEDIT
^E cUI	SGINSERT
^E cUJ	PXSAVE
^E cUK	PXRESTORE
^E cUM	PXZOOM
^E cUR	RECTANGLE
^E cUW	OVERWINDOW
^E cUX	COORDINATEMODE
^E cY	DIRECT-CURSOR-ADDRESS
^E cZ	IDENTIFY
^E c[	CSI
^E c[!p	TEKSTR
^E c[..."p	TEKSCL
^E c[..."q	TEKSCL
^E c[...@	ICH
^E c[...A	CUU
^E c[...B	CUD
^E c[...C	CUF
^E c[...D	CUB
^E c[...H	CUP
^E c[...I	CHT
^E c[...J	ED
^E c[...K	EL
^E c[...L	IL
^E c[...M	DL
^E c[...P	DCH
^E c[...R	CPR
^E c[...S	SU
^E c[...T	SD
^E c[...X	ECH
^E c[...Z	CBT
^E c[... ^S p@	SL
^E c[... ^S pA	SR
^E c[... ^S pN	HTSA
^E c[...c	DA
^E c[...f	HVP
^E c[...g	TBC
^E c[...h	SM
^E c[...i	MC
^E c[...l	RM
^E c[...m	SGR
^E c[...n	DSR
^E c[...r	TEKSTBM
^E c[12h	SRM

COMMANDS BY OPCODE (cont)

OpCode	Command Name
E _c [12l	SRM
E _c [20h	LNМ
E _c [20l	LNМ
E _c [2h	KAM
E _c [2l	KAM
E _c [4h	IRM
E _c [4l	IRM
E _c [<1h	TEKORM
E _c [<1l	TEKORM
E _c [<3l	TEKKEM
E _c [?1h	TEKCKM
E _c [?1l	TEKCKM
E _c [?12l	TEKKANAM
E _c [?18h	TEKPFF
E _c [?19h	TEKPEX
E _c [?19l	TEKPEX
E _c [?25h	TEKTCEM
E _c [?25l	TEKTCEM
E _c [?3h	TEKCOLM
E _c [?3l	TEKCOLM
E _c [?42h	TEKNRCM
E _c [?42l	TEKNRCM
E _c [?5h	TEKSCNM
E _c [?5l	TEKSCNM
E _c [?59h	TEKKKDM
E _c [?59l	TEKKKDM
E _c [?6h	TEKOM
E _c [?6l	TEKOM
E _c [?68h	TEKKBUM
E _c [?68l	TEKKBUM
E _c [?7h	TEKAWM
E _c [?7l	TEKAWM
E _c [?8h	TEKARM
E _c [?8l	TEKARM
E _c `	DMI
E _c \	ST
E _c ^C N	ENTER-BYPASS-MODE
E _c ^E B	4010-HARDCOPY
E _c ^E Q	REPORT-2010-STATUS
E _c ^F F	PAGE
E _c ^S B	ENABLE-2010-GIN
E _c ^S I	SET-ALPHATEXT-FONT
E _c ^S O	SET-ALPHATEXT-FONT
E _c ^S PF	C1TRANSMISSION
E _c ^S PG	C1TRANSMISSION
E _c]	OSC
E _c ^	PM
E _c _	APC
E _c `	SET-4014-LINE-STYLE
E _c a	SET-4014-LINE-STYLE

COMMANDS BY OPCODE (cont)

OpCode	Command Name
E _c b	SET-4014-LINE-STYLE
E _c c	RIS
E _c cc	SET-4014-LINE-STYLE
E _c d	SET-4014-LINE-STYLE
E _c e	SET-4014-LINE-STYLE
E _c f	SET-4014-LINE-STYLE
E _c g	SET-4014-LINE-STYLE
E _c h	SET-4014-LINE-STYLE
E _c i	SET-4014-LINE-STYLE
E _c j	SET-4014-LINE-STYLE
E _c k	SET-4014-LINE-STYLE
E _c l	SET-4014-LINE-STYLE
E _c m	SET-4014-LINE-STYLE
E _c n	LS2
E _c n	SET-4014-LINE-STYLE
E _c o	SET-4014-LINE-STYLE
E _c o	LS3
E _c|	LS3R
E _c }	LS2R
E _c ~	LS1R
E _Q	ENQ
F _F	FF
F _S	ENTER-MARKER-MODE
G _S	ENTER-VECTOR-MODE
H _T	HT
L _F	LF
N _U	NUL
S _B	SUB
S _I	LS1
S _I	SET-ALPHATEXT-FONT
S _O	LS1
S _O	SET-ALPHATEXT-FONT
U _S	ENTER-ALPHA-MODE
V _T	VT

Command Summary

STI ROUTINES BY COMMAND

Command Name	STI Routine
4010-HARDCOPY	LLHC10
ACURSOR	LLACI
BACKINDICES	LLBGIN
BAUDRATE	LLBAUD
BEGINFILLPATTERN	LLBFIL
BEGINPANEL	LLBPNL
BORDER	LLBORD
BOUNDARY	LLDRBM
BREAKTIME	LLBKTM
BYPASSCANCEL	LLBYCH
CANCEL	LLCNCL
CBACKGROUND	LLBGCL
CHARSIZE	LLSCSZ
CLEARIALOG	LLDACL
CMAP	LLCLMP
CMODE	LLCLMD
CODE	LLCODE
COORDINATEMODE	LLCORD
COPY	LLCOPY
CRLF	LLCRLF
CSMOOTH	LLCVSM
CURVE	LLDCV4
CURVE	LLDCVE
DA2INDEX	LLDAAI
DABUFFER	LLDABF
DACHARS	LLDACH
DACMAP	LLDACM
DADELETE	LLDDAR
DAENABLE	LLDAEN
DAINDEX	LLDAIN
DALINES	LLDALN
DAMODE	LLDAWM
DAPOSITION	LLDAXY
DAVISIBILITY	LLDAVS
DAWIDTH	LLDABW
DEFINE	LLDMAC
DIM	LLDIM
DMAP	LLMAPD
DMARKER	LLDMRK
DRAW	LLDRA4
DRAW	LLDRAW
ECHO	LLECHO
EDITCHARS	LLEDCH
ENABLE-4010-GIN	LLGN10
ENDFILLPATTERN	LLFIL
ENDPANEL	LLPNL
ENTER-ALPHA-MODE	LLAMOD

STI ROUTINES BY COMMAND (cont)

Command Name	STI Routine
ENTER-BYPASS-MODE	LLBYP
ENTER-MARKER-MODE	LLMMOD
ENTER-VECTOR-MODE	LLVMOD
EOFSTRING	LLEOF
EOLSTRING	LLEOL
EOMCHARS	LLEOM
ERRORLEVEL	LLERTH
EXPAND	LLEMAC
FILLPATTERN	LLSFIL
FIXUP	LLFXUP
FLAGGING	LLFLAG
GAMODE	LLGAWM
GBACKGROUND	LLBGGR
GINAREA	LLARGN
GINCURSOR	LLCRGN
GINDISABLE	LLDSGN
GINENABLE	LLENGN
GINFILTER	LLTBSF
GINFORMAT	LLSTPP
GINGRIDDING	LLGRGN
GININKING	LLIKGN
GINMAPDEVICE	LLMGIN
GINPICKAPERTURE	LLPKAP
GINRATES	LLGNRT
GINRUBBERBAND	LLRBGN
GINSTARTPOINT	LLSPGN
GINWINDOW	LLWIGN
GRAY	LLGRSF
GSPEED	LLGSPD
GTBEGIN	LLBGCH
GTDELETE	LLDGCH
GTEND	LLEGCH
GTEXT	LLTEXT
GTFONT	LLGFNT
GTGRID	LLGGRD
GTINDEX	LLTXIN
GTPATH	LLCHPA
GTPRECISION	LLGPCR
GTROTATION	LLGROT
GTSIZE	LLGSIZ
GTSLANT	LLGSLT
HARDCOPY	LLHCPY
HCCHARSETS	LLHCCS
HCCOPIES	LLHCPS
HCDAAATTRIBUTES	LLDHCA
HCDATAIRES	LLHCDA

STI ROUTINES BY COMMAND (cont)

Command Name	STI Routine
HCDENSITY	LLHCID
HCDITHER	LLHCDT
HCFEATURES	LLHCFT
HCFORMWIDTH	LLHCFW
HCINTERFACE	LLHCIN
HCMAP	LLINPT
HCMONOCHROME	LLHCMA
HCORIENT	LLHCOR
HCREPAINT	LLCCRP
HCRESERVE	LLHCRE
HCSIZE	LLHCSZ
IGNOREDEL	LLIGDL
KEYEXCHAR	LLKYEX
KEYEXPAND	LLLENKE
KEYMODE	LLKYLK
LFCR	LLLFCR
LINEINDEX	LLLNNIN
LINESTYLE	LLLNST
LOAD	LLLOAD
LOCKKEYBOARD	LLKBLK
LOCKVIEWINGKEYS	LLVKLK
LS0	LLAFNT
LS1	LLAFNT
MARKER	LLMRK4
MARKER	LLMRKR
MARKERTYPE	LLMKTY
MOVE	LLMOV4
MOVE	LLMOVE
MUXSETTINGS	LLMUXS
NVDEFINE	LLDNVM
NVSAVE	LLNVSV
OVERWINDOW	LLOVWI
PAGE	LLPAGE
PANELFILL	LLFPNL
PARITY	LLPRTY
PASSIGN	LLPASG
PBAUD	LLPBAU
PBITS	LLPBIT
PCOPIES	LLPNCP
PCOPY	LLPCPY
PDRAW	LLPDR4
PDRAW	LLPDRW
PEOF	LLPEOF
PFLAG	LLPFLG
PINVERSION	LLPBWI
PLOT	LLPLOT

STI ROUTINES BY COMMAND (cont)

Command Name	STI Routine
PMAP	LLINPN
PMARKER	LLPMR4
PMARKER	LLPMRK
PORIENT	LLPIOR
PPARITY	LLPPRY
PQUEUE	LLPQSZ
PREPAINT	LLPCCR
PROMPTMODE	LLAPRM
PROMPTSTRING	LLSPRM
PXBEGIN	LLBPXL
PXCOPY	LLPXCP
PXPOSITION	LLPXBW
PXRASTERWRITE	LLRASW
PXRECTANGLE	LLRCFL
PXRESTORE	LLRPFM
PXRUNLENGTHWRITE	LLRUN4
PXRUNLENGTHWRITE	LLRUNW
PXSAVE	LLCPTM
PXVIEWPORT	LLPXVW
PXZOOM	LLPXZM
QUEUE SIZE	LLQSIZ
RECTANGLE	LLREC4
RECTANGLE	LLRECT
RENEW	LLRNWV
REOM	LLEOMF
REPORT-4010-STATUS	LLST10
REPORT-COLORHARDCOPY-STATUS	LLQQR4
REPORT-DEVICE-STATUS	LLJQRY
REPORT-ERRORS	LLKQRY
REPORT-GIN-POINT	LLPTGN
REPORT-NETWORK-SETTINGS	LLRNST
REPORT-PORT-STATUS	LLPQRY
REPORT-SEGMENT-STATUS	LLSQRY
REPORT-TERMINAL-SETTINGS	LLIQRY
REPORTLENGTHS	LLSRPL
RESET	LLREST
RLINELENGTH	LLRPM
RSIGCHARS	LLRPSG
SAVE	LLSAVE
SDEFINITIONS	LLDFSF
SET-4014-ALPHATEXT-SIZE	LLAS14
SET-ALPHATEXT-FONT	LLAFNT
SET-NET-ADDRESSES	LLNADD
SET-TELNET-ATTRIBUTES	LLNATT
SGCALL	LLCAS4
SGCALL	LLCASG

STI ROUTINES BY COMMAND (cont)

Command Name	STI Routine
SGCLASS	LLCSSG
SGCLOSE	LLCLSG
SGDELETE	LLDLSG
SGDETECT	LLDTSG
SGDOWN	LLBLSG
SGEDIT	LLEMSG
SGHIGHLIGHT	LLHISG
SGINCLUDE	LLINSG
SGINSERT	LLIISG
SGMATCHINGCLASS	LLMTCL
SGMODE	LLWMSG
SGNEW	LLBNSG
SGOPEN	LLOPSG
SGPICKID	LLPKID
SGPIVOT	LLPVS4
SGPIVOT	LLPVSG
SGPOSITION	LLTNS4
SGPOSITION	LLTNSG
SGPRIORITY	LLPRSG
SGREMOVE	LLDPSG
SGRENAME	LLRNSG
SGREPLACE	LLRESG
SGSCALEROTATE	LLSRSG
SGTRANSFORM	LLIMS4
SGTRANSFORM	LLIMSG
SGUP	LLBHSG
SGVISIBILITY	LLVISG
SNOOPY	LLSNPY
SPRIORITIES	LLPRSF
STOPBITS	LLSTBT
SVISIBILITY	LLVSIF
SYNTAX	LLSNTX
TABS	LLTABS
TBSIZE	LLTBSZ
VATTRIBUTES	LLVWAT
VCLUSTER	LLVWDC
VDELETE	LLDLVW
VIEWPORT	LLVWPT
VIEWPORT	LLVWP4
VSELECT	LLSLVW
VSELECT	LLSLV4
WINDOW	LLWIND
WINDOW	LLWIN4
XMTDELAY	LLXMTD
XMTLIMIT	LLXMTL

COMMANDS BY STI ROUTINE

STI Routine	Command Name
LLACI	ACURSOR
LLAFNT	LS0
LLAFNT	LS1
LLAFNT	SET-ALPHATEXT-FONT
LLAMOD	ENTER-ALPHA-MODE
LLAPRM	PROMPTMODE
LLARGN	GINAREA
LLAS14	SET-4014-ALPHATEXT-SIZE
LLBAUD	BAUDRATE
LLBFIL	BEGINFILLPATTERN
LLBGCH	GTBEGIN
LLBGCL	CBACKGROUND
LLBGGR	GBACKGROUND
LLBGIN	BACKINDICES
LLBHSG	SGUP
LLBKTM	BREAKTIME
LLBLSG	SGDOWN
LLBNSG	SGNEW
LLBORD	BORDER
LLBPNL	BEGINPANEL
LLBPXL	PXBEGIN
LLBYCH	BYPASSCANCEL
LLBYPG	ENTER-BYPASS-MODE
LLCAS4	SGCALL
LLCASG	SGCALL
LLCCRP	HCREPAINT
LLCHPA	GTPATH
LLCLMD	CMODE
LLCLMP	CMAP
LLCLSG	SGCLOSE
LLCNCL	CANCEL
LLCODE	CODE
LLCOPY	COPY
LLCORD	COORDINATEMODE
LLCPTM	PXSAVE
LLCRGN	GINCURSOR
LLCRLF	CRLF
LLCSSG	SGCLASS
LLCVSM	CSMOOTH
LLDAAI	DA2INDEX
LLDABF	DABUFFER
LLDACH	DACHARS
LLDACL	CLEARIALOG
LLDACM	DACMAP
LLDAEN	DAENABLE

COMMANDS BY STI ROUTINE (cont)

STI Routine	Command Name
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LLDAIN	DAINDEX
LLDALN	DALINES
LLDAVS	DAVISIBILITY
LLDAWM	DAMODE
LLDAXY	DAPOSITION
LLDCV4	CURVE
LLDCVE	CURVE
LLDDAR	DADELETE
LLDFS	SDEFINITIONS
LLDGCH	GTDELETE
LLDHCA	HCDAATTRIBUTES
LLDIM	DIM
LLDLG	SGDELETE
LLDLVW	VDELETE
LLDMAC	DEFINE
LLDMRK	DMARKER
LLDNVM	NVDEFINE
LLDPSG	SGREMOVE
LLDRA4	DRAW
LLDRAW	DRAW
LLDRBM	BOUNDARY
LLDSGN	GINDISABLE
LLDTSG	SGDETECT
LLECHO	ECHO
LLEDCH	EDITCHARS
LLEFIL	ENDFILLPATTERN
LLEGCH	GTEND
LLEMAC	EXPAND
LLEMSG	SGEDIT
LLENGN	GINENABLE
LLENKE	KEYEXPAND
LLEOF	EOFSTRING
LLEOL	EOLSTRING
LLEOM	EOMCHARS
LLEOMF	REOM
LLEPNL	ENDPANEL
LLERTH	ERRORLEVEL
LLFLAG	FLAGGING
LLFPNL	PANELFILL
LLFXUP	FIXUP
LLGAWM	GAMODE
LLGFNT	GTFONT
LLGGRD	GTGRID
LLGN10	ENABLE-4010-GIN
LLGNRT	GINRATES
LLGPRC	GTPRECISION
LLGRGN	GINGRIDDING

COMMANDS BY STI ROUTINE (cont)

STI Routine	Command Name
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LLJQRY	REPORT-DEVICE-STATUS
LLKBLK	LOCKKEYBOARD
LLKQRY	REPORT-ERRORS
LLKYEX	KEYEXCHAR
LLKYLK	KEYMODE
LLLFCR	LFCR
LLLNIN	LINEINDEX
LLLNST	LINESTYLE
LLLOAD	LOAD
LLMAPD	DMAP
LLMGIN	GINMAPDEVICE
LLMKTY	MARKERTYPE
LLMMOD	ENTER-MARKER-MODE
LLMOV4	MOVE
LLMOVE	MOVE
LLMRK4	MARKER
LLMRKR	MARKER
LLMTCL	SGMATCHINGCLASS
LLMUXS	MUXSETTINGS
LLNADD	SET-NET-ADDRESSES
LLNATT	SET-TELNET-ATTRIBUTES
LLNVSV	NVSAVE
LLOPSG	SGOPEN
LLOVWI	OVERWINDOW
LLPAGE	PAGE
LLPASG	PASSIGN
LLPBAU	PBAUD
LLPBIT	PBITS
LLPBWI	PINVERSION
LLPCCR	PREPAINT
LLPCPY	PCOPY
LLPDR4	PDRAW
LLPDRW	PDRAW
LLPEOF	PEOF
LLPFLG	PFLAG
LLPIOR	PORIENT
LLPKAP	GINPICKAPERTURE
LLPKID	SGPICKID
LLPLOT	PLOT
LLPMR4	PMARKER
LLPMRK	PMARKER
LLPNCP	PCOPIES
LLPPRY	PPARITY
LLPQRY	REPORT-PORT-STATUS
LLPQSZ	PQUEUE
LLPRSF	PRIORITIES

COMMANDS BY STI ROUTINE (cont)

STI Routine	Command Name
LLPRSG	SGPRIORITY
LLPRTY	PARITY
LLPTGN	REPORT-GIN-POINT
LLPVS4	SGPIVOT
LLPVSG	SGPIVOT
LLPXB	PXPOSITION
LLPXC	PXCOPY
LLPXV	PXVIEWPORT
LLPXZ	PXZOOM
LLQQR	REPORT-COLORHARDCOPY-STATUS
LLQSZ	QUEUESIZE
LLRAS	PXRASTERWRITE
LLRB	GINRUBBERBAND
LLRC	PXRECTANGLE
LLREC	RECTANGLE
LLRECT	RECTANGLE
LLRES	SGREPLACE
LLREST	RESET
LLRNS	SGRENAME
LLGRO	GTROTATION
LLGRS	GRAY
LLGSZ	GTSIZE
LLGSL	GTSLANT
LLGSP	GSPEED
LLHC10	4010-HARDCOPY
LLHCC	HCHARSETS
LLHCDA	HCDATA
LLHCDT	HCDITHER
LLHCFT	HCFEATURES
LLHCFW	HCFORMWIDTH
LLHCID	HCDENSITY
LLHCIN	HCINTERFACE
LLHCMA	HCMONOCHROME
LLHCOR	HCORIENT
LLHCPS	HCCOPIES
LLHCPY	HARDCOPY
LLHCRE	HCRESERVE
LLHCSZ	HCSIZE
LLHIS	SGHIGHLIGHT
LLIGDL	IGNOREDEL
LLIIS	SGINSERT
LLIKGN	GININKING
LLIMS4	SGTRANSFORM
LLIMSG	SGTRANSFORM
LLINPN	PMAP
LLINPT	HCMAP
LLINSG	SGINCLUDE
LLIQRY	REPORT-TERMINAL-SETTINGS
LLRNST	REPORT-NETWORK-SETTINGS
LLRNVW	RENEW

COMMANDS BY STI ROUTINE (cont)

STI Routine	Command Name
LLRPF	PXRESTORE
LLRPM	RLINELENGTH
LLRPS	RSIGCHARS
LLRUN4	PXRUNLENGTHWRITE
LLRUNW	PXRUNLENGTHWRITE
LLSAVE	SAVE
LLSCSZ	CHARSIZE
LLSFIL	FILLPATTERN
LLSLVW	VSELECT
LLSLV4	VSELECT
LLSNPY	SNOOPY
LLSNTX	SYNTAX
LLSPGN	GINSTARTPOINT
LLSPRM	PROMPTSTRING
LLSQRY	REPORT-SEGMENT-STATUS
LLSRPL	REPORTLENGTHS
LLSRSG	SGSCALEROTATE
LLST10	REPORT-4010-STATUS
LLSTBT	STOPBITS
LLSTPP	GINFORMAT
LLTABS	TABS
LLTBSF	GINFILTER
LLTBSZ	TBSIZE
LLTEXT	GTEXT
LLTNS4	SGPOSITION
LLTNSG	SGPOSITION
LLTXIN	GTINDEX
LLVISG	SGVISIBILITY
LLVKLK	LOCKVIEWINGKEYS
LLVMOD	ENTER-VECTOR-MODE
LLVSIF	SVISIBILITY
LLVWAT	VATTRIBUTES
LLVWDC	VCLUSTER
LLVWPT	VIEWPORT
LLWIND	WINDOW
LLWIN4	WINDOW
LLWIGN	GINWINDOW
LLWIN4	VIEWPORT
LLWIND	VIEWPORT
LLWMSG	SGMODE
LLXMTD	XMTDELAY
LLXMTL	XMTLIMIT

SAVEABLE COMMANDS

The NVSAVE command saves the settings of certain commands whose settings changed since the graphics system was last turned on or reset. Commands that can be saved in nonvolatile memory are listed here alphabetically.

Command Name

ACURSOR	ECHO	PACING
ANSWERBACK	EDITCHARS	PARITY
ASIZEGROUP	EOFSTRING	PASSIGN
BASECOLOR	EOLSTRING	PBAUD
BAUDRATE	EOMCHARS	PBITS
BELLTYPE	FLAGGING	PCOPIES
BELLVOLUME	GAMODE	PEOF
BREAKTIME	GINRATES	PFLAG
BYPASSCANCEL	GRESOLUTION	PINVERSION
C1TRANSMISSION	HCBACKGROUND	PMAP
CAPITALS	HCCHARSETS	PORIENT
CHARSIZE	HCCOPIES	PPARITY
CLICK	HCDAAATTRIBUTES	PQUEUE
CODE	HCDATARES	PREPAINT
CRLF	HCDENSITY	PROMPTSTRING
CURSORTYPE	HCDITHER	QUEUE SIZE
CXKEYPAD	HCFEATURES	REOM
DA2INDEX	HCFORMWIDTH	SKCS
DABUFFER	HCINTERFACE	SRM
DACHARS	HCMAP	STOPBITS
DACMAP	HCMONOCHROME	TABS
DAENABLE	HCORIENT	TBSIZE
DAINDEX	HCREPAINT	TEKANM
DALINES	HCSIZE	TEKARM
DAMODE	HOSTPORT	TEKAWM
DAPOSITION	IGNOREDEL	TEKKBUM
DAVISIBILITY	KEYEXCHAR	TEKOM
DAWIDTH	KEYMODE	TEKORM
DBMEMORY	LANGUAGE TYPE	TEKPFF
DBPORT	LFCR	TEKSCNM
DBRECORDMODE	LNМ	TERMINAL
DECTERMINAL	NVDEFINE	XMTDELAY
DMAP	NVLEARN	XMTLIMIT

SYNTAX SUMMARIES

All command descriptions are consistently structured and use an easy-to-read set of syntax conventions. The following list summarizes the overall structure of the command description.

- **Command Name.** Typically, one word or two or more hyphenated words. Command names always appear in uppercase. Following the command name is its *functional name*, which was used in previous manuals to differentiate between commands.

- **Syntax.** Syntax, parameter types, and parameter names for all command modes.

Tek syntax. Used with Tek commands, which are typically used to develop graphics applications, to control communications, and to tailor the graphics system's environment.

Setup syntax. Used with Setup commands, which are a subset of Tek and ANSI commands. You can get a listing of commands and their associated parameter types by issuing the HELP command while in Setup.

ANSI syntax. Used with ANSI commands, which are typically used to develop text editing applications.

VT52 syntax. Used with VT52 commands.

STI syntax. We also include the equivalent STI subroutine calls — STI is described later in this discussion.

- **Parameters.** A brief description of parameters, giving valid ranges and default values if omitted from the command entry, as well as values after a FACTORY command.

ABOUT PLOT 10 STI

PLOT 10 STI (for *Standard Tektronix Interface*) is a high-speed, high-performance graphics software tool for building applications in either C or FORTRAN 77. STI is available as a separate software product.

There is a one-to-one correspondence between firmware features and the user-callable routines in the STI library, allowing the programmer to write C or FORTRAN applications utilizing the full capabilities of the equipment, including direct access to the picture processor.

The STI syntax in the command descriptions shows the subroutine name and parameters that perform the equivalent function as the listed command. The STI parameter types can be compared to the Tek type and can be translated as follows:

- *int* is either type INTEGER in FORTRAN or type long int in C.
- *real* is either type REAL in FORTRAN or type float in C.
- *xy*, *xy+*, or *xyz* are either type INTEGER in FORTRAN or type long int in C.
- *char* or *string* are either type CHARACTER in FORTRAN or type char in C and each is preceded by a length given as an integer. For variable length strings, you must pass the string length to the subroutine.
- Any *array* type is either type INTEGER in FORTRAN or type long int in C with each being preceded by a length given as an integer. For variable length arrays, you must pass the array length to the subroutine.

Refer to the *PLOT 10 STI User Manual* for more information about using STI.

PARAMETER TYPES

The graphics system classifies parameters according to their data format, just as some programming languages classify variable types.

Host parameters are those used in commands issued from an application. Host parameters are used with Tek-style and ANSI-style commands.

Setup parameters are those used with Setup commands issued from the keyboard. Setup commands include both Tek-style and ANSI-style commands. The following tables list and describe the parameter types:

NOTE

While many parameter types are used in both a host command mode and Setup mode, quite often the exact syntax or rules for issuing differ between modes.

PARAMETERS BY COMMAND MODE

Parameter	Command Mode			
	Tek	Setup	ANSI	VT52
char	X	X		
char-array	X			
delim-string		X		
int	X	X		
int-array	X	X		
integer		X		
real	X	X		
real-array	X	X		
xy	X	X		
xy array	X	X		
xy+	X	X		
xy+ array	X	X		
string	X	X		
key-specifier	X	X		
keyword		X		
device	X	X		
Dscs	X	X	X	
Pn	X		X	
Ps		X	X	

TEK HOST PARAMETERS

Type	Description	Example
char	An ASCII character in the range ADE 32 — 127 or 160 — 255.	a
char-array	Allows you to send groups of chars; begins with an <i>int</i> count that specifies the number of <i>chars</i> that follow.	4ABCD
int	A sequence of ASCII characters in the range ADE 32 — 127 or 160 — 255 that represent the encoded value of an integer number.	BV-
int-array	A sequence of encoded integer parameters, beginning with an array count and followed by the elements of the array.	415!A0
real	A pair of encoded integer parameters that express the mantissa and exponent (power of two) of a fractional value. The parameter's value is equal to the mantissa multiplied by 2 raised to the power of the exponent, as in 3×2^{-1} .	3!
real-array	Allows you to send multiple <i>reals</i> ; begins with an <i>int</i> count that specifies the number of <i>reals</i> (pairs of <i>ints</i>) that follow.	3422!32
key-specifier	An <i>int</i> (typically, a macro number) that specifies a keyboard key.	H0
xy	A sequence of ASCII characters that represents the numerical values of <i>x</i> and <i>y</i> coordinates.	'az ^s pM
xy array	A sequence of encoded xy coordinates, beginning with an array count and followed by the xy coordinates.	2+*w

TEK HOST PARAMETERS (cont)

Type	Description	Example
xy+	On Tektronix 3-D graphics systems, <i>xy+</i> parameters represent points that can have <i>xyz</i> coordinates. On the 4211, <i>xy+</i> parameters are the same as <i>xy</i> parameters; that is, there is no <i>z</i> value.	A@0B@0
xy+ array	Sends a variable number of <i>xy+</i> parameters, beginning with an <i>int</i> count that specifies the number of <i>xy+</i> parameters that follow.	2A20B20B0D0
string	A group of ASCII characters sent as a single parameter, beginning with an array count and followed by the characters of the string.	8PRESS ^s pF2
device	A special form of a <i>string</i> that is typically used for file transfer.	3HO:
Dscs	Up to two intermediate characters from Column 2 of the ASCII code chart (range 20 hex to 2F hex) followed by a required final character from Columns 3 to 7 of the ASCII code chart (range 30 hex to 7E hex)	#0

ANSI HOST PARAMETERS

Type	Description	Example
Dscs	Up to two intermediate characters from Column 2 of the ASCII code chart (range 20 hex to 2F hex) followed by a required final character from Columns 3 to 7 of the ASCII code chart (range 30 hex to 7E hex)	#0
Pn	A value in the range 0 to 32767	75
Ps	A numeric value or character value that represents one choice from a predefined list of choices	>6

SETUP PARAMETERS

Type	Description	Example
char	A single character or symbol entered from the keyboard, or its ADE value. ADE's 0 through 9 must be preceded by a 0.	a (character) 97 (ADE) 97 (ADE)
integer	An unencoded whole decimal number.	2400
int-array	A sequence of unencoded integers separated with spaces or a comma. (If a command requires more than one array, surround each array with angle brackets.) does not require an array count.	5,10,15 <3,4>,<7,8> <3,4>,<7,8>
real	A rational number (base 10). <i>Real</i> parameters may be entered in scientific notation using <i>e</i> or <i>E</i> 32E-1 expressions.	3.2 32e1
real-array	Entered in the same format as a <i>real</i> . If one or more parameters follow the real-array, the real-array must be delimited with angle brackets.	<4.5,32e10>
xy	The decimal values of <i>x</i> and <i>y</i> . A default value of 0 is assigned to unspecified coordinates.	500,500
xy array	A sequence of <i>xy</i> -coordinates, each coordinate separated by spaces or a comma.	<50,150 200, 300>
xy+	On Tektronix 3-D graphics systems, <i>xy+</i> parameters represent points that can have <i>xyz</i> coordinates. On the 4211, <i>xy+</i> parameters are the same as <i>xy</i> parameters; that is, there is no <i>z</i> value. A default value of 0 is assigned to unspecified coordinates.	500,500
xy+ array	A sequence of <i>xy</i> -coordinates, each coordinate separated by spaces or a comma. The <i>z</i> value, which is valid on 3-D systems, is ignored.	<0,0,0 1000, 1000,1000>

(continued)

SETUP PARAMETERS (cont)

Type	Description	Example
keyword	Specifies what action you want a command to perform. Can be entire keyword or just as many characters as are necessary to distinguish it from other keywords. If the command has a corresponding host syntax, the integer parameter value can be used instead of the keyword.	EXECUTE E 3
key-specifier	A keystroke, the characters on a key's label, or the macro-number of a key. A <i>key-specifier</i> parameter can be entered any of three ways in Setup: as the macro-number of a key, with an actual <i>key stroke</i> , or as a shifted or unshifted version of function keys F1 through F8 and S1 through S8.	F1 f1 128
string	A group of any alphanumeric or symbol characters other than space and comma. String parameters are unlimited unless otherwise noted.	abc
delim-string	A string of alphanumerics or symbol characters that is delimited with special characters before and after the string.	/THE END/
device	Typically used for file transfer commands; entered as an unlimited <i>string</i> .	HO:
Dscs	Entered as a <i>delim-string</i> .	/A/
Pn	A numeric parameter in the range 0 — 32767. There is no special encoding scheme for this parameter type.	75
Ps	A parameter selected from a given list. There is no special encoding scheme for this parameter type.	=5

REPORT SUMMARIES

The graphics system uses the reports described here to return graphics or graphics system status to the host. The following table describes each type of report parameter that may appear in the reports. The reports are briefly described following the table.

REPORT PARAMETER TYPES

Type	Description	Example
char-report	An ASCII character with an ADE in the range 32 — 126 or 160 — 255.	M
int-report	Encoded form of integers, reported as one to six ASCII characters sent in this order: [Hi...] Lo!	''M-
intc-report	Encoded form of integers, reported as two to six ASCII characters sent in this order: [Hi...] Lo!	!S7
12-bit-xy report	Encoded form of 12-bit precision x- and y-coordinate values; reported as five ASCII characters sent in this order: Hi-Y, Extra, Lo-Y, Hi-X, Lo-X	'!;sp-
10-bit-xy report	Encoded form of 10-bit precision x- and y-coordinate values; reported as four ASCII characters sent in this order: Hi-X, Lo-X, Hi-Y, Lo-Y	`:/4
char-array-report	A series of char-reports preceded by an array count. The array count is an int-report that tells how many individual array items will follow.	2MA

REPORT PARAMETER TYPES (cont)

Type	Description	Example
int-array-report	A series of int-reports preceded by an array count. The array count is an int-report that tells how many individual array items will follow.	3123
xy report	Identical to 12-bit-xy report when in Coordinate mode 0. Reported as two individual intc-reports when in coordinate mode 1 or 2: x-coord, y-coord	+ 'w
xy+ report	Identical to 12-bit-xy report when in Coordinate mode 0. Identical to xy report when in Coordinate mode 1.	+ 'w
xy array-report	A series of xy reports preceded by an array count. The array count is an int-report that tells how many individual array items will follow.	2+ 'w#7 'n/T
xy+ array-report	A series of xy+ reports preceded by an array count. The array count is an int-report that tells how many individual array items will follow.	2+ 'w#w#+ 'w#w#
real-report	Encoded form of a real number; reported as two int-reports — the mantissa and the exponent.	3!
real-array-report	A series of real-reports preceded by an array count. The array count is an int-report that tells how many individual array items follow.	22!3!

COMMAND SUMMARIES

4010-HARDCOPY 4010-HARDCOPY

§11 Peripherals

Copies the contents of the screen to a hardcopy unit attached to the Copier port (same as **HARDCOPY** command with a *hardcopy-code* parameter of 0).

Syntax

Tek: $E_C E_B$

Setup: None

STI: LLHC10

Parameters

None

ACursor SET-ALPHA-Cursor-Indices

§15 Dialog Area

Specifies two color indices for the dialog area alpha cursor.

Syntax

Tek: E_cTD int: *first-index*
int: *second-index*

Setup: ACURSOR integer: *first-index*
integer: *second-index*

STI: LLACI (*first-index, second-index*)

Parameters

first-index

Specifies the first index of the alpha cursor. Valid range is 0 to 32767.

Defaults: After FACTORY = 1
Omitted = 0

second-index

Specifies the second index of the alpha cursor. Valid range is 0 to 32767.

Defaults: After FACTORY = 0
Omitted = 0

ANSWERBACK ANSWERBACK

\$6 Reports

Specifies the answerback string returned in response to an ENQ command (or to a Ctrl-Break keypress).

Syntax

Setup: **ANSWERBACK**
delim-string: *answerback-message*

Parameters

answerback-message (up to twenty characters)

Specifies characters (in the range ADE 0 to 127) to be returned in response to an ENQ command.

Defaults: After FACTORY = empty array
Omitted = empty array

APC APPLICATION-PROGRAM-COMMAND

§4 Command Syntax

Initiates an application program command string.

Syntax

ANSI: APC (9F hex) or
E_C (1B,5F hex)

Setup: None

Parameters

None

ASIZEGROUP*SELECT-ALPHATEXT-SIZE-GROUP*

§14 Text

Specifies the group of character sizes that will be available to the next SET-4014-ALPHATEXT-SIZE command.

Syntax

Tek: $\text{\textcircled{R}}_c\text{MY}$ int: *group*
 Setup: **ASIZEGROUP** integer: *group*
 STI: **LLSZG** (*group*)

Parameters*group*

Specifies the group of character sizes for the next SET-4014-ALPHATEXT-SIZE command:

0	4111 group compatibility
1	412X group compatibility
2	4014 group compatibility
Defaults:	After FACTORY = 1 Omitted = 1

AUTOPRINT*See MC*

AUTOREPEAT*See TEKARM*

AUTOWRAP*See TEKAWM*

BACKINDICES*SET-BACKGROUND-INDICES*

§18 Graphics Primitives

Specifies the background index for string-precision graphtext and for alphatext displayed in the graphics area; also specifies the dash-gap index (the index used for gaps in dashed lines).

Syntax

Tek: $\text{\textcircled{R}}_c\text{MB}$ int: *text-background-index*
 int: *dash-gap-index*
 Setup: **BACKINDICES**
 integer: *text-background-index*
 integer: *dash-gap-index*
 STI: **LLBGIN** (*text-background-index, dash-gap-index*)

Parameters*text-background-index*

Specifies the background index for string-precision graphtext and alphatext that is displayed in the graphics area.

-2	The wipe index for the current viewport
-1	No index; the pixels in character backgrounds are left unchanged
0 to 32767	A specific color index or color range
Defaults:	After FACTORY = -2 Omitted = 0

dash-gap-index

Determines the color index for the 'gaps' in dashed lines.

-2	The wipe index for the current viewport
-1	No index; the pixels in the gaps in dashed lines are left unchanged
0 to 32767	A specific color index or color range
Defaults:	After FACTORY = -1 Omitted = 0

BASECOLOR BASECOLOR

§15 Dialog Area

Determines whether the graphics system displays alphanumeric data in two or four colors during coax communications. Requires Coax Option (Option CX).

Syntax

Setup: BASECOLOR keyword: *color-mode*

Parameters

color-mode

Determines how characters in fields are displayed when no extended attributes are present. Valid values are:

MONOCHROME

Green and white

BASE Red, green, blue, and white.

Defaults: After FACTORY = BASE
Omitted = (no change)

BAUDRATE SET-BAUD-RATES

§9 Host Communications

Specifies transmit and receive data rates for the host port (logical device HO:).

Syntax

Tek: E_cNR int: *transmit-data-rate*
int: *receive-data-rate*

Setup: BAUDRATE integer: *transmit-data-rate*
integer: *receive-data-rate*

STI: LLBAUD (*transmit-data-rate, receive-data-rate*)

Parameters

transmit-data-rate

The rate, in bits per second, at which the RS-232-C host port transmits characters to the host computer. Valid values are 1 (which specifies *external clock*), 50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, and 38400 (1 and 38400 are not available on the GS4211).

Defaults: After FACTORY = 2400
Omitted = error NR11 (Level 2)

receive-data-rate

The rate at which the RS-232-C host port receives characters from the host computer. Valid values are the same as for *transmit-data-rate*, except that a data rate of 0 means that the graphics system uses a receive data rate equal to the transmit data rate.

Defaults: After FACTORY = 2400
Omitted = 0 (use *transmit-data-rate*)

BEGINFILLPATTERN**BEGIN-FILL-PATTERN**

§16 Pixel Operations

Begins or deletes fill patterns.

Syntax

Tek: $\text{\textcircled{R}}_c\text{MD}$ int: *fill-pattern-number*
 int: *pattern-width*
 int: *pattern-height*
 int: *bits-per-pixel*

Setup: BEGINFILLPATTERN
 integer: *fill-pattern-number*
 integer: *pattern-width*
 integer: *pattern-height*
 integer: *bits-per-pixel*

STI: LLBFIL (*fill-pattern-number, pattern-width,*
 pattern-height, bits-per-pixel)

Parameters*fill-pattern-number*

Specifies the fill pattern to be defined or deleted. Valid values are 1 to 32767.

Defaults: After FACTORY = (none)
 Omitted = Error MD11 (Level 2)

pattern-width

Specifies the width of the pattern in pixels. Valid values are 1 to 1024.

Defaults: After FACTORY = (none)
 Omitted = Error MD21 (Level 2)

pattern-height

Specifies the height of the pattern in pixels or that the pattern is to be deleted. The minimum valid value is 0, which deletes the pattern. The maximum valid value is 768

Defaults: After FACTORY = (none)
 Omitted = 0

bits-per-pixel

Specifies the number of bits per pixel encoded in the PXRASTERWRITE and PXRUNLENGTHWRITE commands that define the fill pattern. Valid values are 1 to 8.

Defaults: After FACTORY = (none)
 Omitted = Error MD41 (Level 2)

BEGINPANEL *BEGIN-PANEL-BOUNDARY*

§18 Graphics Primitives

Begins the definition of a panel boundary.

Syntax

Tek: $\text{\textcircled{R}}_c\text{LP}$ xy: *first-point*
 int: *draw-boundary*

Setup: BEGINPANEL
 xy: *first-point*
 integer: *draw-boundary*

STI: LLBPNL (*first-point [x,y], draw-boundary*)

Parameters*first-point*

Specifies the xy-coordinate of the point where the panel boundary begins and ends. The range of valid values for x and y is -2^{31} to $2^{31}-1$.

Defaults: After FACTORY = (none)
 Omitted = 0,0

draw-boundary

Determines whether the panel boundary will be drawn or not.

0 Boundary not drawn (Setup: **NO**).

1 Boundary drawn (Setup: **YES**).

Defaults: After FACTORY = (none)
 Omitted = 0

BEL *BELL*

§10 Keyboards

Rings the graphics system's bell.

Syntax

Tek: $\text{\textcircled{R}}_L$

Binary: None (but see ALPHATEXT)

ANSI: $\text{\textcircled{R}}_L$

VT52: $\text{\textcircled{R}}_L$

STI: None (but see ALPHATEXT)

BELLTYPE SET-BELL-TYPE

§10 Keyboards

Sets the keyboard bell type.

Syntax

Setup: **BELLTYPE** keyword: *belltype*

Parameters

belltype

Specifies how the graphics system responds to a series of BEL characters. Valid values are:

CONTINUOUS

A single, elongated bell tone whose duration is based on the number of bell commands sent.

DISCRETE A separate bell tone for each bell command.

Defaults: After **FACTORY** = **CONTINUOUS**
Omitted = **CONTINUOUS**

BELLVOLUME SET-BELL-VOLUME

§10 Keyboards

Sets the keyboard bell volume.

Syntax

Setup: **BELLVOLUME**
keyword: *bellvolume*

Parameters

bellvolume

Disables the bell or enables the bell and selects its volume. Valid values are:

OFF Disables the keyboard bell.

LOW Enables the bell and sets its volume to low.

MEDIUM Enables the bell and sets its volume to medium.

HIGH Enables the bell and sets its volume to high.

Defaults: After **FACTORY** = **MEDIUM**
Omitted = **MEDIUM**

BORDER SET-BORDER-VISIBILITY

§17 Viewing System

Sets the visibility of the current view's border.

Syntax

Tek: **RE** int: *border-visibility*
Setup: **BORDER** keyword: *border-visibility*
STI: **LLBORD** (*border-visibility*)

Parameters

border-visibility

Specifies whether the border of the current view is visible or invisible.

0 Invisible (Setup: **NO**)

1 Visible (Setup: **YES**)

2 If visible, becomes invisible and vice-versa (Setup: **TOGGLE**)

Defaults: After **FACTORY** = 0
Omitted = 0

BOUNDARY SET-DRAW-BOUNDARY-MODE

§18 Graphics Primitives

Specifies whether boundaries are drawn on panels created with the **RECTANGLE** command.

Syntax

Tek: **UB** int: *draw-boundary-mode*
Setup: **BOUNDARY** keyword: *draw-boundary-mode*
STI: **LLDRBM** (*draw-boundary-mode*)

Parameters

draw-boundary-mode

Specifies whether boundaries of panels created by the **RECTANGLE** command are drawn.

0 Boundaries are not drawn (Setup: **NO**)

1 Boundaries are drawn (Setup: **YES**)

Defaults: After **FACTORY** = 0
Omitted = 0

BREAKTIME *SET-BREAK-TIME**§9 Host Communications*

Sets the duration of the Break signal.

Syntax

Tek: E_cNK int: *break-time-in-milliseconds*
 Setup: **BREAKTIME** integer: *break-time-in-milliseconds*
 STI: **LLBKTM** (*break-time-in-milliseconds*)

Parameters*break-time-in-milliseconds*

Specifies the approximate duration of the Break signal.

0 to 65535 Specifies a duration in milliseconds. A value of zero causes no break signal to be sent.

Defaults: After FACTORY = 200
 Omitted = 0

BS *BACKSPACE**§14 Text*

Moves the alpha cursor position one space in the direction opposite to alphatext.

Syntax

Tek: B_s
 ANSI: B_s
 VT52: B_s
 Setup: None
 STI: None

Parameters

None

BYPASSCANCEL
*SET-BYPASS-CANCEL-CHAR**§9 Host Communications*

Specifies the character that terminates Bypass mode.

Syntax

Tek: E_cNU int: *bypass-cancel-char*
 Setup: **BYPASSCANCEL** char: *bypass-cancel-char*
 STI: **LLBYCH** (*bypass-cancel-char*)

Parameters*bypass-cancel-char*

Specifies the character used to cancel Bypass mode.

0 to 127 Specifies the ADE of the Bypass cancel character.

Defaults: After FACTORY = 10 (U character)
 Omitted = 0 (N character)

C1TRANSMISSION
*SELECT-C1-TRANSMISSION MODE**§9 Host Communications*

Specifies whether seven or eight bits are to be used when transmitting C1 control characters in predefined function key definitions and in ANSI reports.

Syntax

Tek: $\text{E}_c^s\text{P}_7\text{F}$ (Selects seven-bit C1 transmission)
 $\text{E}_c^s\text{P}_8\text{G}$ (Selects eight-bit C1 transmission)

ANSI: Same as Tek.

Setup: **C1TRANSMISSION** keyword: *C1-transmission-mode*

Parameters*C1-transmission-mode* (Setup only)

Specifies whether seven or eight bits are to be used when transmitting C1 control characters in function key definitions and in ANSI reports.

7BIT Sends C1 controls as seven-bit two-character escape sequences

8BIT Sends C1 controls as single eight-bit bytes

Defaults: After FACTORY = 7BIT
 Omitted = 7BIT

CAN CANCEL

§4 Command Syntax

Terminates control sequences, escape sequences, and control strings.

Syntax

ANSI: c_N (18 hex)

Setup: None

Parameters

None

CANCEL CANCEL COMMAND

§3 System Initialization

Stops ongoing actions and sets several parameters and modes.

Syntax

Tek: cKC

Setup: CANCEL

STI: LLCNCL

Parameters

None

CAPITALS CAPITALS

§15 Dialog Area

Specifies whether a graphics system emulating an IBM 3179G or 3192G displays alphanumeric characters as all uppercase or as mixed uppercase and lowercase. Requires Coax Option (Option CX).

Syntax

Setup: CAPITALS keyword: *capitals-mode*

Parameters

capitals-mode

Specifies how to display alphanumerics.

YES Display all alphanumerics as uppercase

NO Display alphanumerics as mixed case.

Defaults: After FACTORY = NO

Omitted = NO

CBACKGROUND

SET-BACKGROUND-COLOR

§13 Colors, Surfaces

This command sets the color of the background surface.

Syntax

Tek: cTB int: *first-color-coordinate*
 int: *second-color-coordinate*
 int: *third-color-coordinate*

Setup: CBACKGROUND

integer: *first-color-coordinate*
 integer: *second-color-coordinate*
 integer: *third-color-coordinate*

STI: LLBGCL (*first-coordinate-color,*
 second-coordinate-color,
 third-coordinate-color)

Parameters

first-color-coordinate

The first coordinate in either the HLS, RGB, CMY, or Machine RGB color system. The valid range depends on the *color-specifying-mode* set by the most recent CMODE command:

RGB	0 to 100
CMY	0 to 100
HLS	-32768 to 32767
Machine RGB	0 to 255

Defaults: After FACTORY = 0
Omitted = 0

second-color-coordinate

The second coordinate in either the HLS, RGB, CMY, or Machine RGB color system. The valid range depends on the *color-specifying-mode* set by the most recent CMODE command:

RGB	0 to 100
CMY	0 to 100
HLS	0 to 100
Machine RGB	0 to 255

Defaults: After FACTORY = 0
Omitted = 0

third-color-coordinate

The third coordinate in either the HLS, RGB, CMY, or Machine RGB color system. The valid range depends on the *color-specifying-mode* set by the most recent CMODE command. A blinking color can be specified by adding 1000 to the value of this coordinate:

RGB	0 to 100 or 1000 to 1100
CMY	0 to 100 or 1000 to 1100
HLS	0 to 100 or 1000 to 1100
Machine RGB	0 to 255 or 1000 to 1255

Defaults: After FACTORY = 0
Omitted = 0

CBT *CURSOR-BACKWARD-TABULATION*

§15 Dialog Area

Moves the active position a number of tab stops toward the beginning of the active line.

Syntax

ANSI: $\text{^c}[Pn: \textit{number-of-tab-stops} Z$

Setup: None

Parameters

number-of-tab-stops

Specifies the number of tab stops to move the active position. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

CHARSIZE *SET-CHARACTER-SIZE*

§14 Text

Specifies alphanumerical character size for the active dialog area, the graphics area, or all dialog areas plus the graphics area.

Syntax

Tek: ^cMU int: *area-selector*
 int: *number-of-lines*
 int: *number-of-columns*

Setup: CHARSIZE integer: *area-selector*
 integer: *number-of-lines*
 integer: *number-of-columns*

STI: LLSCSZ (*area-selector, number-of-lines,*
 number-of-columns)

Parameters

area-selector

Specifies which area is affected.

- 1 All dialog areas and the graphics area (Setup: **ALL**).
- 0 Only the graphics area (Setup: **GRAPHICS**).
- 1 Only the active dialog area, or Dialog Area 1 if no dialog area is enabled (Setup: **DIALOG**).

Defaults: After FACTORY = -1
Omitted = 1

number-of-lines

Specifies the requested number of lines per screen.
Valid entries are 0 to 32767.

Defaults: After FACTORY = 34
Omitted or 0 = 1

number-of-columns

Specifies the requested number of columns per screen.
Valid entries are 0 to 32767.

Defaults: After FACTORY = 80
Omitted or 0 = 1

CHT *CURSOR-FORWARD-TABULATION*

§15 Dialog Area

Moves the active position a number of tab stops toward the end of the active line.

Syntax

ANSI: $\text{Pn: number-of-tab-stops I}$

Setup: None

Parameters

number-of-tab-stops

Specifies the number of tab stops to move the active position. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

CLEARDIALOG *CLEAR-DIALOG-SCROLL*

§15 Dialog Area

Replaces all lines in the active dialog area's buffer with blank lines.

Syntax

Tek: LZ

Setup: **CLEARDIALOG**

STI: **LLDACL**

Parameters

None

CLICK *CLICK*

§10 Keyboards

Enables or disables key click.

Syntax

Setup: **CLICK** keyword: *click-mode*

Parameters

click-mode

Turns key-click on or off.

YES Enables key click.

NO Disables key click.

Defaults: After FACTORY= NO
Omitted = NO

CMAP SET-SURFACE-COLOR-MAP

§13 Colors, Surfaces

Sets the index-to-color mappings for a particular surface.

Syntax

Tek: [®]cTG int: *surface-number*
 int-array: *color-mixtures*

Setup: CMAP integer: *surface-number*
 integer-array: *color-mixtures*

STI: LLCLMP (*surface-number, length, color-mixtures*)

Parameters*surface-number*

Specifies the surface for which color mixtures are being defined.

-1 Super surface (all bit-planes of all defined surfaces)

1 to 8 Surface number

Defaults: After FACTORY = 1
 Omitted = Error TG11 (Level 2)

color-mixtures (length 0 to 32768 [multiple of 4])

This array must be specified in multiples of four. The first int of the multiple of 4 designates the color index; the following three ints specify the color mixture for that color index.

first element: color-index

0 to 255 Color index

If an index is specified that is greater than the maximum index available on the surface, the maximum index is used.

second element: first-color-coordinate

The first coordinate in either the HLS, RGB, CMY, or Machine RGB color system. The valid range depends on the *color-specifying-mode* set by the most recent CMODE command:

RGB 0 to 100

CMY 0 to 100

HLS -32768 to 32767

Machine RGB 0 to 255

third element: second-color-coordinate

The second coordinate in either the HLS, RGB, CMY, or Machine RGB color system. The valid range depends on the *color-specifying-mode* set by the most recent CMODE command:

RGB 0 to 100

CMY 0 to 100

HLS 0 to 100

Machine RGB 0 to 255

fourth element: third-color-coordinate

The third coordinate in either the HLS, RGB, CMY, or Machine RGB color system. The valid range depends on the *color-specifying-mode* set by the most recent CMODE command. A blinking color can be specified by adding 1000 to the value of this coordinate:

RGB 0 to 100 or 1000 to 1100

CMY 0 to 100 or 1000 to 1100

HLS 0 to 100 or 1000 to 1100

Machine RGB 0 to 255 or 1000 to 1255

Defaults: After FACTORY = See Default Table for first 8 indices.
 Omitted = no change

FACTORY DEFAULT COLOR INDICES

Index	Color	H	L	S
0	Black	0	0	0
1	White	0	100	0
2	Red	120	50	100
3	Green	240	50	100
4	Blue	0	50	100
5	Cyan	300	50	100
6	Magenta	70	50	100
7	Yellow	180	50	100

The Factory and Power-up defaults for the 4211 terminal have 256 colors. Only seven of these colors are listed in the above table. Refer to the *Color Standards and Default Color Maps* appendix in the Programmers manual for a list of the remaining default colors.

CMODE SET-COLOR-MODE

§13 Colors, Surfaces

Sets the color specifying mode, the color overlay mode, and the gray mode.

Syntax

Tek: cTM int: *color-specifying-mode*
 int: *color-overlay-mode*
 int: *gray-mode*

Setup: CMODE integer: *color-specifying-mode*
 integer: *color-overlay-mode*
 integer: *gray-mode*

STI: LLCLMD (*color-specifying-mode*,
 color-overlay-mode, *gray-mode*)

Parameters

color-specifying-mode

Determines which system of color coordinates is used to specify color mixtures in subsequent color operations. Valid parameters are:

No change	0
RGB	1
CMY	2
HLS	3
Machine RGB	4
Defaults:	After FACTORY = 3 Omitted = 0

color-overlay-mode

Specifies HOW colors from separate surfaces are placed mixed. Valid parameters are:

No change	0
opaque	1
subtractive	2
additive	3
Defaults:	After FACTORY = 1 Omitted = 0

gray-mode

Specifies whether operation is color or black and white. Valid parameters are:

No change	0
COL	1 (displays images in color)
BW	2 (displays images in black and white)
Defaults:	After FACTORY = 1 Omitted = 0

CODE *SELECT-CODE**§4 Command Syntax*

Selects a syntax for host commands and optionally initializes certain graphics system parameters.

Syntax*NOTE*

This command is syntactically a single command only in Setup. In the host syntaxes, it is actually a group of ISO commands that cause similar interrelated actions. The following table shows the relationship between Setup syntax (which is used in the parameter descriptions), ISO commands, and STI arguments.

Cross-Reference		
Syntax-mode / Init-mode	ISO	STI
TEK NOINIT	$\text{E}_c\%!0$	0
ANSI NOINIT	$\text{E}_c\%!1$	1
ANSI MULTINATIONAL	$\text{E}_c\#s_1$	-1
ANSI VT100 (see note)	$\text{E}_c\%!2$	2
ANSI VT100 (see note)	$\text{E}_c\#s_2$	-2
ANSI VT200	$\text{E}_c\#s_5$	5
ANSI VT282	$\text{E}_c\#s_7$	7
VT52 NOINIT	$\text{E}_c\%!3$	3

NOTE

There are two escape sequences for invoking ANSI VT100. The first reflects the original command and is necessary for compatibility. The second complies with the ISO 2022 standard and is the new format invoking ANSI VT100 — use this format as you develop new applications.

Tek:	All ISO commands in preceding table
ANSI:	Same as Tek
VT52:	Same as Tek
Setup: CODE	keyword: <i>syntax-mode</i> keyword: <i>init-mode</i>
STI: LLCODE	(<i>syntax-mode</i> , <i>init-mode</i>)

Parameters*syntax-mode*

Specifies the host syntax for subsequent commands. Valid values are TEK, ANSI, and VT52. See preceding cross-reference table for relation to ISO commands and STI arguments. One or two settings are made as follows:

TEK	ENTER-ALPHA-MODE DAENABLE with same parameter as last DAENABLE
ANSI	DAENABLE YES if currently NO
VT52	DAENABLE YES if currently NO
Defaults:	After FACTORY = TEK Omitted = TEK

init-mode

Specifies the graphics system parameters to be set to particular values. NOINIT is a valid *init-mode* value for all values of *syntax-mode*. For *syntax-mode* ANSI, other valid values are MULTINATIONAL, VT100, VT200, and VT282.

MULTINATIONAL

C1TRANSMISSION 8BIT
LANGUAGETYPE EUROPEAN
SKCS ASCII MULTINATIONAL

VT100	C1TRANSMISSION 7BIT DABUFFER 24 DACHARS 80 DALINES 24 DAVISIBILITY YES DAWIDTH 80 DECTERMINAL VT100 EDITMARGINS 1 24 (TEKSTBM) INSERTREPLACE REPLACE (IRM) KEYEXPAND NO LANGUAGETYPE EUROPEAN ORIGINMODE ABSOLUTE (TEKOM)
-------	--

Keyboard emulates VT100 when Tek key light is off.

VT200 C1TRANSMISSION 7BIT
DABUFFER 24
DACHARS 80
DALINES 24
DAVISIBILITY YES
DAWIDTH 80
DECTERMINAL VT240
EDITMARGINS 1 24 (TEKSTBM)
INSERTREPLACE REPLACE (IRM)
KEYEXPAND NO
LANGUAGETYPE EUROPEAN
ORIGINMODE ABSOLUTE (TEKOM)
SKCS DECMULTINATIONAL

Keyboard emulates VT200 when Tek key light is *off*.

VT282 C1TRANSMISSION 7BIT
DABUFFER 24
DACHARS 80
DALINES 24
DAVISIBILITY YES
DAWIDTH 80
DECTERMINAL VT282
EDITMARGINS 1 24 (TEKSTBM)
INSERTREPLACE REPLACE (IRM)
KEYEXPAND NO
LANGUAGETYPE DECKANJI
ORIGINMODE ABSOLUTE (TEKOM)

Keyboard emulates VT200 when Tek key light is *off*.

Defaults: After FACTORY = NOINIT
Omitted = NOINIT

COLUMNMODE *See TEKCOLM*

§15 Dialog

CONTROLLERMODE *See MC*

§11 Peripherals

COORDINATEMODE

SET-COORDINATE-MODE

§4 Command Syntax

Specifies the format for *xy* and *xy+* parameters, *xy reports* and *xy+ reports*, and the length of *intc-reports*.

Syntax

Tek: $\%cUX$ int: *coordinate-mode*
 int: *intc-report-size*

Setup: COORDINATEMODE
 integer: *coordinate-mode*
 integer: *intc-report-size*

STI: LLCORD (*coordinate-mode, intc-report-size*)

Parameters

coordinate-mode

Specifies the format of *xy* and *xy+* parameters, and *xy report* and *xy+ report* message types. Valid values for the 4211 are -2 to 1; valid values for the GS4211 are -2 to 0.

-2	restores a previous coordinate mode
-1	saves the current coordinate mode
0	addresses 12-bit modeling space
1	addresses 32-bit modeling space (not on GS4211)

Defaults: After FACTORY = 0
Omitted = 0

intc-report-size

Specifies the number of characters in succeeding *intc-reports* sent. Valid values are 0 to 6.

Defaults: After FACTORY = 3
Omitted = 0

COPY *COPY*

§8 File System

Copies a file from the specified *source* to the specified *destination*.

Syntax

Tek: $\text{\textasciitilde{c}}\text{JC}$ device: *source*
 string: *separator*
 device: *destination*

Setup: COPY string: *source*
 string: *separator*
 string: *destination*

STI: LLCOPY (*length, source, length, separator, length, destination*)

Parameters*source*

Specifies the source device of the file being copied.
 Must be one of the following: HO:, P0:, P1:, SC:, SC:0, or SC:1.

Defaults: After FACTORY = (none)
 Omitted = Error JC11 (Level 2)

separator

Must be the empty string or **TO**.

Defaults: After FACTORY = (none)
 Omitted = empty string

destination

Specifies the destination device for the file being copied.
 Must be one of the following: HO:, P0:, P1:, HC:, HC:0, HC:1, or HC:2.

Defaults: After FACTORY = (none)
 Omitted = error JC31 (Level 2)

CPR *ACTIVE-POSITION-REPORT*

§15 Dialog Area

A report of the active cursor position (returned in response to a DSR command with a parameter value of 6).

Syntax

ANSI: $\text{\textasciitilde{c}}[$ Pn: *row-number* ;
 Pn: *column-number* **R**

Setup: None

Parameters*row-number*

The number of the line (row) the active position is in.

1 to 32767 Specifies a row

Defaults: After FACTORY = (none)
 Omitted = (none)

column-number

The number of the column the active position is in.

1 to 32767 Specifies a Column

Defaults: After FACTORY Command = (none)
 Omitted = (none)

CR *CARRIAGE-RETURN*

§14 Text

Moves the active position to the beginning of the active line.

Syntax

Tek: $\text{\textasciitilde{c}}_{\text{R}}$

ANSI: $\text{\textasciitilde{c}}_{\text{R}}$

VT52: $\text{\textasciitilde{c}}_{\text{R}}$

Setup: None

STI: None

Parameters

None

CRLF *CRLF*

§14 Text

Controls whether a c_R is executed as only a c_R or as a c_R and a L_F .

Syntax

TEK: \mathbb{E}_c KR int: *CRLF-mode*
 Setup: CRLF keyword: *CRLF-mode*
 STI: LLCRLF (*CRLF-mode*)

Parameters

CRLF-mode

Specifies how c_R characters are executed.

0 As c_R only (Setup: **NO**).
 1 As $c_R^L_F$ (Setup: **YES**).
 Defaults: After FACTORY = 0
 Omitted = 1

CSI *CONTROL-SEQUENCE-INTRODUCER*

§4 Command Syntax

Introduces ANSI control sequences.

Syntax

ANSI: CSI (9B hex) or
 \mathbb{E}_c [(1B,5B hex)
 Setup: None

Parameters

None

CSMOOTH *SET-CURVE-SMOOTHNESS*

§18 Graphics Primitives

Sets the curve-smoothness.

Syntax

Tek: \mathbb{E}_c UG real: *smoothness*
 Setup: CSMOOTH real: *smoothness*
 STI: LLCVSM (*smoothness*)

Parameters

smoothness

Specifies the smoothness of curves.

0.0 to 1.0 0.0 is the smoothest (1 degree per vector)
 and 1.0 is the roughest (45 degrees per
 vector).

Defaults: After FACTORY = 0.09091
 Omitted = 0.0

CUB *CURSOR-LEFT*

§15 Dialog Area

Moves the active position a specified number of columns to the left.

Syntax

ANSI: \mathbb{E}_c [Pn: *number-of-columns* D
 Setup: None

Parameters

number-of-columns

Specifies the number of columns the active position is to be moved towards the beginning of the active line. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
 Omitted or 0 = 1

CUD *CURSOR-DOWN*

§15 Dialog Area

Moves the active position a specified number of lines.

Syntax

ANSI: Pn : *number-of-lines* B

Setup: None

Parameters

number-of-lines

Specifies the number of lines the active line is to be moved down. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

CUF *CURSOR-RIGHT*

§15 Dialog Area

Moves the active position a specified number of columns to the right.

Syntax

ANSI: Pn : *number-of-columns* C

Setup: None

Parameters

number-of-columns

Specifies the number of columns the active position is to be moved towards the end of the active line. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

CUID *CUID*

§5 Programming Services

Gives the user additional information identifying the IBM 3174/3274 Control Unit to which the graphics system is attached. Requires Coax Option (Option CX).

Syntax

Setup: CUID

Parameters

None

CUP *CURSOR-POSITION*

§15 Dialog Area

Moves the active position to a specified row and column.

Syntax

ANSI: Pn : *row-number* ;
column-number H

Setup: None

Parameters

row-number

Specifies the row to which the active position is to be moved. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

column-number

Specifies the column to which the active position is to be moved. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

CURSOR-DOWN *CURSOR-DOWN*

§15 Dialog Area

Moves the active position down one row without moving it horizontally.

Syntax

VT52: E_cB

Parameters

None

CURSOR-LEFT *CURSOR LEFT*

§15 Dialog Area

Moves the active position one column to the left.

Syntax

VT52: E_cD

Parameters

None

CURSOR-RIGHT *CURSOR-RIGHT*

§15 Dialog Area

Moves the active position one column to the right.

Syntax

VT52: E_cC

Parameters

None

CURSOR-TO-HOME *CURSOR-TO-HOME*

§15 Dialog Area

Moves the active position to the home position.

Syntax

VT52: E_cH

Parameters

None

CURSOR-UP *CURSOR-UP*

§15 Dialog Area

Moves the active position up one row without moving it horizontally.

Syntax

VT52: E_cA

Parameters

None

CURSORENABLE *See TEKTCM*

CURSORKEYMODE *See TEKCKM*

CURSORTYPE *CURSORTYPE*

§15 Dialog Area

Selects an underline or a block as the dialog area alpha cursor.

Syntax

Setup: **CURSORTYPE**
 keyword: *cursor-type*

Parameters*cursor-type*

Specifies which type of cursor is to be used for the alpha cursor.

UNDERLINE

Specifies underline type cursor

BLOCK Specifies block type cursor

Defaults: After **FACTORY** = **UNDERLINE**
 Omitted = **UNDERLINE**

CURVE *DRAW-CURVE*

§18 Graphics Primitives

Draws a curve using the current curve smoothness value set with **CSMOOTH**.

Syntax

Tek: **%cUC** int: *curve-type*
 xy-array: *list-of-points*

Setup: **CURVE** keyword: *curve-type*
 xy-array: *list-of-points*

STI: **LLDCVE** (*curve-type, length, list-of-points*)
 LLDCV4 (*curve-type, length, list-of-points*)

Parameters*curve-type*

Specifies the type of curve to be drawn.

- 1 Circular arcs from the graphics position through pairs of points (Setup: **ARC**).
- 2 Circular arcs from the graphics position through pairs of points with chord drawn back to the graphics position (Setup: **CHORD**).
- 3 Circular arcs from the graphics position through pairs of points, with a vector drawn from each arc's end point to the center, and another vector drawn from the arc's center back to the graphics position (Setup: **PIE**).

Defaults: After **FACTORY** command = (none)
 Omitted = Error UC11 (Level 2)

list-of-points (length 0 to 8192, even)

Array of pairs of xy points that define the curve to be drawn. The range of valid values for x and y is -2^{31} to $2^{31}-1$.

Defaults: After **FACTORY** = (none)
 Omitted = 0

CUU CURSOR-UP

§15 Dialog Area

Moves the active position a specified number of rows upward.

Syntax

ANSI: ESC [Pn: *number-of-lines* A

Setup: None

Parameters

number-of-lines

Specifies the number of lines the active line is to be moved upward in the active dialog area. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

CXKEYPAD CX-KEYPAD

§10 Keyboards

Determines whether the numeric keypad transmits numbers or programmed functions during coax communication. Requires Coax Option (Option CX).

Syntax

Setup: CXKEYPAD keyword: *keypad-mode*

Parameters

keypad-mode

Specifies how the keypad on the Coax option keyboard operates when in 3179G emulation.

PF	Keypad keys are mapped to 3179G Program Function keys PF13 through PF24 (shifted and unshifted).
NUMERIC	Keypad keys work as numeric keys (shifted and unshifted).
BOTH	Unshifted keypad keys are PF keys and shifted keypad keys are numeric.
Defaults:	After FACTORY = PF Omitted = PF

DA *DEVICE-ATTRIBUTES*

Causes the graphics system to send the host reports that are similar to VT100/VT200 terminal reports.

Syntax

ANSI: $\text{Esc}[Ps: \text{device-status-request } c$

Setup: None

Parameters*device-status-request*

The type of status requested.

0 Primary

>0 Secondary

Defaults: After FACTORY = (none)
Omitted = 0

Description

This command causes the graphics system to send the host reports which are similar to VT100/VT200 reports. The graphics system's response depends on the DEC terminal type selected by the DECTERMINAL or CODE command.

When a primary *device-status-request* is made, the graphics system responds with a report that indicates what type of DEC terminal the graphics system is like:

$\text{Esc}[\text{?}62;1;2;5;6;8;10c$ (Returned if DECTERMINAL is VT282) Reports that the graphics system is like a VT220 or VT240 with the following features: service class 2, 132 columns, printer port, Katakana, selective erase, user-defined keys and two-byte Kanji.

$\text{Esc}[\text{?}62;1;2;6;7;8;9c$ (Returned if DECTERMINAL is VT220 or VT240) Reports that the graphics system is like a VT220 or VT240 with the following features: service class 2, 132 columns, printer port, selective erase, dynamically redefinable character set, user-defined keys and 7-bit National character sets.

$\text{Esc}[\text{?}1;2c$

(Returned if DECTERMINAL is VT100) Reports that the graphics system is like a VT100 terminal with the Advanced Video Option.

$\text{Esc}[\text{?}1;0c$

(Returned if DECTERMINAL is VT101) Reports that the graphics system is like a VT101 terminal.

$\text{Esc}[\text{?}6c$

(Returned if DECTERMINAL is VT102) Reports that the graphics system is like a VT102 terminal.

When a secondary *device-status-request* is made, the graphics system responds with further information on the DEC terminal type:

$\text{Esc}[\text{>}1;20;0c$

(Returned if DECTERMINAL is VT100, VT101, VT102, or VT220) Reports that the graphics system is like a VT220 terminal with firmware version 2.0 and no options.

$\text{Esc}[\text{>}2;20;0c$

(Returned if DECTERMINAL is VT240) Reports that the graphics system is like a VT240 terminal with firmware version 2.0 and no options.

$\text{Esc}[\text{>}15;15;nc$

(Returned if DECTERMINAL is VT282) Reports that the graphics system is like a VT282 terminal with firmware version 1.5, and the *n* is 1 if Sony/Tek Option 4L is installed or 0 if Option 4L is not installed.

The graphics system does not enter Bypass mode when sending these reports to the host. Instead, if the reports are echoed back to the graphics system, the graphics system treats the echoes as no-ops.

DA2INDEX

SET-DIALOG-AREA-ALTERNATE-INDEX

Sets the active dialog area's boldface color index.

Syntax

Tek: $\text{\textcircled{E}}_c\text{LJ}$ int: *bold-index*
Setup: DA2INDEX integer: *bold-index*
STI: LLDAAI (*bold-index*)

Parameters

bold-index

Specifies the color index to be used for boldface characters. Valid range is 0 to 32767.

Defaults: After FACTORY = 2
 Omitted = 0

DABUFFER

SET-DIALOG-AREA-BUFFER-SIZE

§15 Dialog Area

Specifies the number of lines in the active dialog area's buffer.

Syntax

Tek: $\text{\textcircled{E}}_c\text{LB}$ int: *number-of-lines*
Setup: DABUFFER integer: *number-of-lines*
STI: LLDABF (*number-of-lines*)

Parameters

number-of-lines

Specifies the number of lines in the dialog buffer. Valid range is 1 through 32767.

Defaults: After FACTORY = 128
 Omitted = error LB11

DACHARS

SET-DIALOG-AREA-CHARS

§15 Dialog Area

Specifies the width of the active dialog viewport in characters per line.

Syntax

Tek: $\text{\textcircled{E}}_c\text{LC}$ int: *number-of-chars*
Setup: DACHARS integer: *number-of-chars*
STI: LLDACH (*number-of-chars*)

Parameters

number-of-chars

Specifies number of characters per line in the dialog viewport. Valid range is 1 to 170.

Defaults: After FACTORY = 80
 Omitted = error LC11

DACMAP

SET-DIALOG-AREA-COLOR-MAP

§13 Colors, Surfaces

Sets the color map for all dialog areas.

Syntax

Tek: $\text{\textcircled{E}}_c\text{TF}$ int-array: *color-mixture*
Setup: DACMAP integer-array: *color-mixture*
STI: LLDACM (*length, color-mixture*)

Parameters

color-mixture (length 0 to 32768)

Specifies zero or more quadruples that consist of a color index and three color coordinates to specify the HLS, CMY, RGB or Machine RGB values for that index. Each color index is limited to the range of 0 to 7. See CMAP for valid values of the color coordinates. The quadruples are in the following form:

quadruple= int: *color-index*
 int: *first-color-coordinate*
 int: *second-color-coordinate*
 int: *third-color-coordinate*

Defaults: After FACTORY = See table below.
 Omitted = no change

DEFAULT DIALOG COLOR MAP

Index	Color	Color Modes								
		HLS			RGB			CMY		
0	Black	0	0	0	0	0	0	100	100	100
1	White	0	100	0	100	100	100	0	0	0
2	Red	120	50	100	100	0	0	0	100	100
3	Green	240	50	100	0	100	0	100	0	100
4	Blue	0	50	100	0	0	100	100	100	0
5	Cyan	300	50	100	0	100	100	100	0	0
6	Magenta	60	50	100	100	0	100	0	100	0
7	Yellow	180	50	100	100	100	0	0	0	100

DEFAULT DIALOG COLOR MAP (cont.)

Index	Color	Color Mode		
		Machine RGB		
0	Black	0	0	0
1	White	255	255	255
2	Red	255	0	0
3	Green	0	255	0
4	Blue	0	0	255
5	Cyan	0	255	255
6	Magenta	255	0	255
7	Yellow	255	255	0

COAX NOTES

If the HLS value for Index 4 is 0,50,100 at power-up, that index **will** change to HLS 330,60,100 when HOSTPORT COAX is first entered. When an NVSAVE command is executed, the current color map settings are saved. If the initial HLS values for Index 4 are different than 0,50,100 at power-up, that index **will not** change when HOSTPORT COAX is entered.

DADELETE *DELETE-DIALOG-AREA**§15 Dialog Area*

Deletes a dialog area.

Syntax

Tek: ^cKK int: *dialog-area*

Setup: **DADELETE** integer: *dialog-area*

STI: **LLDDAR** (*dialog-area*)

Parameters*dialog-area*

- 1 Deletes all dialog areas except dialog area 1.
- 0 Deletes the current dialog area except dialog area 1.
- 2 to 64 The number of a specific dialog area to be deleted.
- Defaults: After FACTORY = (none)
Omitted = 0

DAENABLE *ENABLE-DIALOG-AREA**§15 Dialog Area*

Enables the specified dialog area.

Syntax

Tek: ^cKA int: *dialog-area*

Setup: **DAENABLE** keyword: *dialog-area*

STI: **LLDAEN** (*dialog-area*)

Parameters*dialog-area*

- Specifies which dialog area is to be enabled.
- 0 Disables all dialog areas (Setup: **NO**).
- 1 Enables dialog area 1 (Setup: **YES**).
- 2 to 64 Enables the specified dialog area.
- Defaults: After FACTORY = 1
Omitted = 1

DAINDEX SET-DIALOG-AREA-INDEX

§15 Dialog Area

Specifies the color indices for the dialog area character foreground, character background and background wipe index.

Syntax

Tek: E_cLI int: *character-index*
 int: *char-background-index*
 int: *dialog-wipe-index*

Setup: DAINDEX integer: *character-index*
 integer: *char-background-index*
 integer: *dialog-wipe-index*

STI: LLDAIN (*character-index*,
 char-background-index,
 dialog-wipe-index)

Parameters

character-index

Specifies the color index to be used for characters in the dialog area. Valid range is 0 to 65535.

Defaults: After FACTORY = 1
 Omitted = 0

char-background-index

Specifies the color index to be used for character background in the dialog area. Valid range is 0 to 65535.

Defaults: After FACTORY = 0
 Omitted = 0

dialog-wipe-index

Specifies the color index to be used for the dialog background. Valid range is 0 to 65535.

Defaults: After FACTORY = 0
 Omitted = 0

DALINES SET-DIALOG-AREA-LINES

§15 Dialog Area

Specifies the height (in lines) of the active dialog viewport.

Syntax

Tek: E_cLL int: *number-of-lines*

Setup: DALINES integer: *number-of-lines*

STI: LLDALN (*number-of-lines*)

Parameters

number-of-lines

Specifies the number of lines in the dialog viewport. Valid range is 1 to 32767.

Defaults: After FACTORY = 34
 Omitted = error LL11

DAMODE SET-DIALOG-AREA-WRITING-MODE

§15 Dialog Area

Specifies how Space and Underscore characters are treated in the active dialog area.

Syntax

Tek: E_cLM int: *writing-mode*

Setup: DAMODE keyword: *writing-mode*

STI: LLDAWM (*writing-mode*)

Parameters

writing-mode

Specifies whether Space (E_P) and Underscore (E_U) characters overstrike or replace existing characters in the active dialog area:

- 0 Space and Underscore characters replace existing characters (Setup: **REPLACE**)
- 1 Space and Underscore characters overstrike existing characters (Setup: **OVERSTRIKE**)

Defaults: After FACTORY = 0
 Omitted = 0

DAPOSITION *SET-DIALOG-AREA-POSITION**§15 Dialog Area*

Positions the active dialog viewport on the screen.

Syntax

Tek: $\%cLX$ *xy: lower-left-corner*

Setup: **DAPOSITION**
 xy: lower-left-corner

STI: **LLDAXY** (*lower-left-corner [x,y]*)

Parameters*lower-left-corner*

Specifies the screen position of the lower left corner of the dialog viewport. Valid range is X = 0 to 4095, Y = 0 to 4095.

Defaults: After FACTORY = (0,0)
 Omitted = (0,0)

DAVISIBILITY *SET-DIALOG-AREA-VISIBILITY**§15 Dialog Area*

Makes the active dialog area visible or invisible.

Syntax

Tek: $\%cLV$ *int: visibility-mode*

Setup: **DAVISIBILITY**
 keyword: visibility-mode

STI: **LLDAVS** (*visibility-mode*)

Parameters*visibility-mode*

Specifies whether the active dialog area is visible or invisible.

0 Dialog area is invisible (Setup: **NO**).

1 Dialog area is visible (Setup: **YES**).

Defaults: After FACTORY = 1 for Dialog Area 1
 Omitted = 1

DAWIDTH *SET-DIALOG-AREA-BUFFER-WIDTH**§15 Dialog Area*

Sets the width of the active dialog area's buffer.

Syntax

Tek: $\%cLW$ *int: number-of-chars*

Setup: **DAWIDTH** *integer: number-of-chars*

STI: **LLDABW** (*number-of-chars*)

Parameters*number-of-chars*

Specifies number of characters per line in the dialog buffer.

0 Specifies that the buffer is as wide as the dialog viewport

1 to 170 Specifies an explicit width

Defaults: After FACTORY = 0
 Omitted = 0

DBMEMORY *DBMEMORY**§5 Programming Services*

Allocates memory for a transaction buffer for the DFT mode debugger. Requires Coax Option (Option CX).

Syntax

Tek: None

Setup: **DBMEMORY** *integer: memory-blocks*

Parameters*memory-blocks*

Specifies the number of 1K blocks of memory to allocate. Valid value is 0 through 500.

Defaults: After FACTORY = 2
 Omitted = 0

DBPORT *DBPORT*

§5 Programming Services

Controls the destination of any subsequent output from the PLAY command. Requires Coax Option (Option CX).

Syntax

Tek: None

Setup: DBPORT keyword: *port-identifier*

Parameters

port-identifier Identifies the destination for the output of the PLAY command.

SCREEN	Directs output to the active dialog area or to the graphics area if no dialog area is enabled
HOST	Directs output to the RS-232-C host port
P0	Directs output to Peripheral Port P0
P1	Directs output to Peripheral Port P1
Defaults:	After FACTORY = SCREEN Omitted = SCREEN

DBRECORDMODE *DBRECORDMODE*

§5 Programming Services

Specifies the amount of data recorded by the DFT mode debugger. Requires Coax Option (Option CX).

Syntax

Setup: DBRECORDMODE keyword: *record-mode*

Parameters

record-mode Specifies the amount of data recorded by the debugger. Valid values are:

OFF	Turns off recording.
PARTIAL	Truncates outbound data to 32 bytes, inbound data to 256 bytes or to first segment of segmented RU.
FULL	Records all data and transactions.
Defaults:	After FACTORY = OFF Omitted = OFF

DCH *DELETE-CHARACTER*

§15 Dialog Area

Deletes the specified number of characters from the active line, starting at the active position.

Syntax

ANSI: %c[Pn: *number-of-characters* P

Setup: None

Parameters

number-of-characters

Specifies the number of characters to be deleted. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

DCS *DEVICE-CONTROL-STRING-INTRODUCER*

§4 Command Syntax

Initiates a device control string.

Syntax

ANSI: DCS (90 hex) or
%cP (1B,50 hex)

Setup: None

Parameters

None

DECDDL**DEC-DOWNLOAD-SOFT-CHARACTERS****§14 Text**

Downloads user-defined characters for a Dynamically Redefinable Character Set (DRCS).

Syntax

ANSI: E_cP

Ps: *DRCS-buffer* ;
 Pn: *starting-character* ;
 Ps: *erase-control* ;
 Ps: *subcell-width* ;
 Ps: *font-width* ;
 Ps: *text-or-full-cell* ;
 Pn: *subcell-height* ;
 Ps: *character-set-size*

{

Dscs: *character-set-name*
 [*Sxhp* [; *Sxhp*] . . .]

$\text{E}_c\backslash$

Setup: None

Parameters*DRCS-buffer*

Specifies the DRCS buffer into which the character set is loaded. Valid values are 0 and 1.

Defaults: After FACTORY = (none)
 Omitted or 0 = 1

starting-character

Selects the external character code (position in the coded character set) for the first character for which a pixel pattern is being downloaded. Valid values are 0 to 95.

Defaults: After FACTORY = (none)
 Omitted = 0

erase-control

Selects which character pixel patterns to erase before loading the new pixel patterns. Here, "erase" means "remove the user-defined pattern: replace it with the predefined pixel pattern for that character, or with a backwards question mark if there is no predefined pixel pattern for that character." Valid values are:

- 0 Erase all pixel patterns for this coded character set (*DRCS-buffer*) in this *font-width*.
- 1 Erase only those pixel patterns in the locations for which characters are being downloaded.
- 2 Erase all pixel patterns in both *font-widths*.

Defaults: After FACTORY = (none)
 Omitted = 0

subcell-width

Specifies the size in pixels of the VT200-style character subcell that will hold the pixel patterns being downloaded. Valid values are:

- 0 Specifies the default value (same as 4)
- 2 5x10 VT200-style pixels
- 3 6x10 VT200-style pixels
- 4 7x10 VT200-style pixels

Defaults: After FACTORY = (none)
 Omitted or 0 = 4

font-width

Specifies the total character cell size of the font into which character shapes are being downloaded. Valid values are:

- 0 Specifies the default value (same as 1)
- 1 "80-column" font: 12x30 pixels (8x10 VT200-style pixels)
- 2 "132-column" font: 7x30 pixels (6x10 VT200-style pixels)

Defaults: After FACTORY = (none)
 Omitted or 0 = 1

Command Summary

text-or-full-cell

Specifies whether the character font being downloaded is a "text font" or a "full cell font." Valid values are:

- 0 Specifies the default value (same as 1)
- 1 Text font
- 2 Full cell

Defaults: After FACTORY = (none)
Omitted or 0 = 1

subcell-height

This parameter is not used. (Valid value is 0.)

Defaults: After FACTORY = (none)
Omitted = 0

character-set-size

Selects whether the coded character set being downloaded is a 94- or 96-character set. Valid values are:

- 0 94-character set
- 1 96-character set

Defaults: After FACTORY = (none)
Omitted = 0

character-set-name (length 1 to 3)

This Dscs sequence serves as the name by which the coded character set being downloaded will be referenced in future SELECTCHARSET commands. The syntax is as follows:

character-set-name = [*I* [*I*]] *F*

where:

I = 20h or 21h or ... or 2Fh

F = 30h or 31h or ... or 7Eh

Defaults: After FACTORY = (none)
Omitted = (none)

Sxbp

Each *Sxbp* (sixel bit pattern) represents the pixel pattern for a user-defined character being downloaded into a character subcell within a character cell. The syntax is as follows:

Sxbp = sixel-row [*I* sixel-row] ...

where:

sixel-row = *S* ...

S = 3Fh or 40h or ... or 7Eh

Defaults: After FACTORY = (none)
Omitted = (none)

DECFUNCTIONKEYS

DECFUNCTIONKEYS

\$7 Macros

Locks or unlocks all the VT200 macros programmed for the VT200 function keys.

Syntax

Setup: **DECFUNCTIONKEYS** keyword: *lock-extent*

Parameters

lock-extent

Specifies whether VT200 macros are locked or unlocked:

UNLOCK Unlocks the VT200 key definitions.

LOCK Locks the VT200 key definitions.

Defaults: After FACTORY = **UNLOCK**
Omitted = **UNLOCK**

DECODE *DECODE**§5 Programming Services*

Converts parameters into numeric notation and displays the result to the user.

Syntax

Setup: **DECODE** keyword:*parameter-type*
delim-string:*parameter-data*

Parameters*parameter-type*

Defines what type of parameter the string represents.
The allowable *keywords* are:

INT	The string contains an <i>int</i> parameter
RINT	The string contains an <i>int-report</i> parameter
REAL	The string contains a <i>real</i> parameter
RREAL	The string contains a <i>real-report</i> parameter
XY	The string contains a <i>12-bit-xy</i> parameter
RXY	The string contains a <i>12-bit-xy-report</i> parameter
32XY	The string contains a <i>32-bit-xy</i> parameter
R32XY	The string contains a <i>32-bit-xy-report</i> parameter
4010XY	The string contains a <i>4010 xy</i> parameter
R4010XY	The string contains a <i>4010 xy-report</i> parameter
Defaults:	After FACTORY = (none) Omitted = Error

parameter-data

The string to be decoded. The string must be delimited.

Defaults: After FACTORY = (none)
Omitted = Error

DECTERMINAL *DECTERMINAL**§3 System Initialization*

Selects the DEC terminal types that the graphics system will report in response to a DA command.

Syntax

Setup: **DECTERMINAL** keyword: *terminal-type*

Parameters*terminal-type*

Specifies the DEC terminal type to be reported. Must be *VT100*, *VT101*, *VT102*, *VT220*, *VT240*, or *VT282*.

Defaults: After FACTORY = VT240 if Sony/Tek
Option 4L not installed, VT282 if Option 4L
installed
Omitted = VT240

DECUDK *DEC-USER-DEFINED-KEYS**§7 Macros*

Defines or deletes a VT200 macro.

Syntax

ANSI: \mathbb{R}_c P Ps: *clear-extent* ;
Ps: *lock-extent*
|
KeyMacStr: *key-macro-string* . . .
 \mathbb{R}_c \

Setup: None

Parameters*clear-extent*

Determines which VT200 macros are cleared and when:

0	Clears all VT200 macros before programming new values.
1	Replaces VT200 macros only when new macros are loaded.

Defaults: After FACTORY = (none)
Omitted = 0

Command Summary

lock-extent (0 or 1)

Determines whether the VT200 macros are locked or not locked after they are loaded.

- | | |
|---|--|
| 0 | Locks all keys at completion of loading. |
| 1 | Does not lock all keys at completion of loading. |

Defaults: After FACTORY = (none)
Omitted = 0

key-macro-string

The macro definition to be loaded to the specified VT200 function key. Each *key-macro-string* has the following format:

Pn: *key-number* / *macro-string*

key-number

Specifies the VT200 function key to be programmed.

- | | |
|----------|---|
| 17 to 21 | Specifies Function Keys F6 through F10, respectively |
| 23 to 26 | Specifies Function Keys F11 through F14, respectively |
| 28 | Specifies the Help key |
| 29 | Specifies the Do key |
| 31 to 34 | Specifies Function Keys F17 through F20, respectively |

macro-string

Specifies a sequence of macro definition data. Each character of the macro definition is encoded as two hexadecimal digits representing its ASCII code. Any spaces within the macro definition are ignored. If the macro-string consists of an odd number of hexadecimal digits, the last digit is ignored. (Hexadecimal digits A through F may be upper- or lower-case.)

Defaults: After FACTORY = (none)
Omitted = 0

DEFINE *DEFINE-MACRO*

§7 Macros

Defines or deletes a volatile Tek macro.

Syntax

Tek: \mathbb{R}_c KD key-specifier: *macro-number*
int-array: *macro-contents*

Setup: DEFINE key-specifier: *macro-number*
delim-string: *macro-contents*

STI: LLDMAC (*macro-number*, *length*, *macro-contents*)

Parameters

macro-number

Specifies the volatile macro to be defined or deleted:

–32768 to –32513 Byte macros

–861 to –2 Key macros

–1 All macros (deletes all volatile macros).

0 to 143 Key macros

144 to 32767 Host macros

Any character (Setup) Key macros 0 to 127

F1 to F8 (Setup) Key macros 128 to 135

S1 to S8 (Setup) Key macros 136 to 143

Defaults: After FACTORY = (none)
Omitted = 0

macro-contents (array of length 0 through $2^{28} - 1$)

Specifies the bytes (in the range 0 to 255) that are issued when the macro is expanded. An array of length 0 deletes the specified volatile macro.

Defaults: After FACTORY = (none)
Omitted = empty array

DIM *DIM-ENABLE**§11 Peripherals*

Enables or disables automatic screen dimming.

Syntax

Tek: $\text{\textasciixc}KG$ int: *enable-mode*
 Setup: **DIM** keyword: *enable-mode*
 STI: **LLDIM** (IDIM)

Parameters*enable-mode*

Specifies whether or not the graphics system screen dims automatically after five minutes of no interaction.

0 Disables automatic screen dimming
 (Setup: **NO**)
 1 Enables automatic screen dimming (Setup:
 YES)
 Defaults: After FACTORY = 1
 Omitted = 0

DIRECT-CURSOR-ADDRESS*DIRECT-CURSOR-ADDRESS**§15 Dialog Area*

Moves the active position to a specified row and column.

Syntax

VT52: $\text{\textasciixc}Y$ char: *row* char: *column*

Parameters*row*

The destination row in the dialog area for the active position. Specified as an ASCII character whose decimal equivalent is the row number plus 31. Valid range is 1 (\textasciixcP) through 96 (\textasciixcT).

column

The destination column in the dialog area for the active position. Specified as an ASCII character whose decimal equivalent is the row number plus 31. Valid range is 1 (\textasciixcP) through 80 (o).

DISPLAY-ALPHATEXT*DISPLAY-ALPHATEXT**§14 Text*

Displays an alphatext character in the active dialog area or in the graphics area, if no dialog area is enabled.

Syntax

Tek: char: *text-char* (Implicit form)
 u_s char: *text-char* (Explicit form)

ANSI: char: *text-char*

VT52: char: *text-char*

Setup: None

STI: None

Parameters*text-char*

Specifies the character to be displayed. Valid byte values are:

32 to 127 A Graphics Left (GL) character.
 160 to 255 A Graphics Right (GR) character.
 Defaults: After FACTORY = (none)
 Omitted = (none)

DL *DELETE-LINE**§15 Dialog Area*

Deletes a specified number of lines from the active dialog buffer, starting with the active line.

Syntax

ANSI: $\text{\textasciixc}[$ Pn: *number-of-lines* M

Setup: None

Parameters*number-of-lines*

Specifies the number of lines to be deleted. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
 Omitted or 0 = 1

DMAP MAP-DEVICES

§8 File System

Establishes a logical connection between the specified physical device and logical device.

Syntax

Tek: **ꞑcJM** device: *logical-device*
 char-array: *physical-device*
 char-array: *options-list*

Binary: op(JM) Same as Tek.

Setup: **DMAP** string: *logical-device*
 string: *physical-device*
 string: *options-list*

STI: **LLMAPD** (*length, logical-device, length,*
 physical-device, length, options-list)

Parameters

logical-device

Specifies the logical device to which the physical device is connected.

HO: Host computer port

physical-device

Specifies the physical device to which the logical device is connected.

NTN LAN IEEE 802.3 port

SP0 COMPUTER RS-232-C port

Defaults: After FACTORY = see above
 Omitted = Error JM21 Level 2

options-list (length 0 or 2 to 65)

Specifies the host computer identifier for HO: to NTN mapping.

Defaults: After FACTORY = null
 Omitted = 0 length

DMARKER DEFINE-MARKER

§18 Graphics Primitives

Defines a marker.

Syntax

Tek: **ꞑcRM** int: *type*
 int: *marker-number*
 int-array: *marker-definition*

Setup: **DMARKER** integer: *type*
 integer: *marker-number*
 integer-array: *marker-definition*

STI: **LLDMRK** (*type, marker-number, length, marker-*
 definition)

Parameters

type (must be 0).

Defaults: After FACTORY = 0
 Omitted = 0

marker-number

Specifies the marker number of the marker being defined

11 — 127 Specifies a marker number

Defaults: After FACTORY = (none)
 Omitted = Error RM21 (Level 2)

marker-definition (array length 16)

Specifies the marker-definition bit pattern; each element of the array must be in the range 0 through 255.

Defaults: After FACTORY = (none)
 Omitted = Error RM31 (Level 2)

DMI *DISABLE-MANUAL-INPUT**§10 Keyboards*

Locks the keyboard.

Syntax

ANSI: $\text{E}_c \text{ `}$

Setup: See LOCKKEYBOARD

Parameters

None

DRAW *DRAW**§18 Graphics Primitives*

Draws a vector from the graphics position to a given point.

Syntax

Tek: $\text{E}_c \text{ LG}$ $xy+:$ *position* (first explicit form)
 $\text{G}_s \text{ B}_L$ $xy+:$ *position* (second explicit form)
 $xy+:$ *position* (implicit form)

Setup: **DRAW** $xy+:$ *position*

STI: **LLDRAW** (*position* [x,y])
LLDRA4 (*position* [x,y])

Parameters*position*

Specifies the end point of a line (a vector) in modeling space drawn from the graphics position. The range of valid values for x and y is -2^{31} to $2^{31} - 1$.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

DSR *DEVICE-STATUS-REPORT**§18 Graphics Primitives*

Queries for the status of the graphics system, keyboard, and printer.

Syntax

ANSI: $\text{E}_c [\text{ Ps: } status \text{ n}$

Parameters*status*

Specifies the type of status reports. The valid requests are:

5	Operating condition of the graphics system
6	The active position (Row and Column)
?15	Printer status
?25	VT200 function key status
?26	Keyboard nationality
Defaults:	After FACTORY = (none) Omitted or 0 = (none)

Description

This command causes the graphics system to send reports to the host about the general operating status of the graphics system, the keyboard, and the printer. The reports are similar to the reports of the VT200 terminals.

The graphics system does not enter Bypass mode when sending these reports to the host. Instead, if the reports are echoed back to the graphics system, it ignores the echoes.

Reports sent in response to ANSI commands do not include end-of-line strings. Thus, when the terminal sends this message, it does not append an EOL-string to it.

The Device-Status-Report Format (ANSI)

The ANSI DSR (Device-Status-Report) is sent in response to the DSR command. When the command is issued with a parameter value of 5, the report returns $E_c[0n$, if the graphics system is functioning properly, and $E_c[3n$, if it's not.

When the command is issued with a parameter value of 6, the report returns the row and column positions of the active position. See "The Cursor-Position-Report Format", which follows, for more details.

When the command is issued with a parameter value of ?15, the report returns information on a printer connected to the copier port of the graphics system. The graphics system will report:

$E_c[?10n$ if the printer is ready
 $E_c[?11n$ if the printer is not ready
 $E_c[?13n$ if the printer is not connected

When the command is issued with a parameter value of ?25, the report returns information about the VT200 user-defined keys. The graphics system will report:

$E_c[?20n$ if the VT200 user-defined keys are unlocked
 $E_c[?21n$ if the VT200 user-defined keys are locked.

When the command is issued with a parameter value of ?26, the report returns information about the keyboard nationality.

The graphics system will report:

$E_c[?27;1n$ if the North American keyboard is attached
 $E_c[?27;2n$ if the United Kingdom keyboard is attached
 $E_c[?27;7n$ if the German keyboard is attached
 $E_c[?27;9n$ if the Italian keyboard is attached
 $E_c[?27;12n$ if the Swedish keyboard is attached
 $E_c[?27;13n$ if the Danish/Norwegian keyboard is attached
 $E_c[?27;14n$ if the French Keyboard is attached
 $E_c[?27;15n$ if the Spanish Keyboard is attached

The Cursor-Position-Report (CPR) Format

The Cursor-Position-Report is sent in response to the DSR (DEVICE-STATUS-REPORT) command with a *status* parameter of 6. This report contains the Line (row) and Column coordinates of the active position in the display buffer. *Row 1, Column 1* indicates the upper left corner of the scroll buffer.

These coordinates are relative to the first line of the dialog buffer, except when Origin mode is relative and Edit margins are set. In this case, the position is relative to the first line of the scrolling region that is bounded by the Edit margins.

When a character is put in the last column of a row, the active position remains in the last column and autowrap-pending-mode is turned on. The position reported is still the last column of the line, even though, when Autowrap mode is on, the next character will be placed in the first column of the next row.

The report has the following format:

CSI Pn:row-number;
Pn:column-number R

The following describes the elements of the Cursor-Position-Report.

row-number; The line (row) number of the active position.

1 to 32767

column-number; The column number of the active position.

1 to 32767

ECH *ERASE-CHARACTER*

§15 Dialog Area

Erases the specified number of characters, starting with the character at the active position.

Syntax

ANSI: E_c [Pn: *number-of-characters* X

Setup: None

Parameters*number-of-characters*

Specifies the number of characters to be erased. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

ECHO *SET-ECHO*

§9 Host Communications

Specifies whether the graphics system echoes locally characters that the user enters at the keyboard.

Syntax

Tek: E_cKE int: *echo-mode*

ANSI: See SRM

Setup: **ECHO** keyword: *echo-mode*

STI: **LLECHO** (*echo-mode*)

Parameters*echo-mode*

Specifies whether characters typed on the keyboard are echoed by the graphics system.

0 Echo off (Setup: **NO**).
1 Echo on (Setup: **YES**).

Defaults: After FACTORY = 0
Omitted = 0

ED *ERASE-IN-PAGE*

§15 Dialog Area

Erases a specified part of the active dialog buffer.

Syntax

ANSI: E_c [Ps: *erase-extent* J

Setup: None

Parameters*erase-extent*

Specifies how much to erase and whether to erase all characters or only erasable ones.

0 Erase characters from the active position to the end of the dialog buffer.
1 Erase characters from the beginning of the dialog buffer to the active position.
2 Erase the entire dialog buffer.
?0 Erase all erasable characters from the active position to the end of the dialog buffer.
?1 Erase all erasable characters from the beginning of the dialog buffer to the active position.
?2 Erase all erasable characters in the dialog buffer.

Defaults: After FACTORY = (none)
Omitted = 0

EDITCHARS SET-EDIT-CHARS

§4 Command Syntax

Sets the values of the *char-delete*, *line-delete*, and *take-literally* characters. Used to edit command lines in Setup and in Telnet local mode.

Syntax

Tek: $\text{\textcircled{c}}\text{KZ}$ int: *char-delete*
 int: *line-delete*
 int: *take-literally*

Setup: **EDITCHARS** char: *char-delete*
 char: *line-delete*
 char: *take-literally*

STI: **LLEDCH** (*char-delete, line-delete, take-literally*)

Parameters

char-delete

Specifies the editing character for deleting characters from command lines. Must be in the range 0 through 127.

Defaults: After FACTORY = 127 ($\text{\textcircled{r}}$)
 Omitted = unchanged

line-delete

Specifies the editing character for deleting command lines. Must be in the range 0 through 127.

Defaults: After FACTORY = 24 ($\text{\textcircled{n}}$)
 Omitted = unchanged

take-literally

Specifies the editing character that marks control characters as literals in command lines. Must be in the range 0 through 127.

Defaults: After FACTORY = 126 ($\text{\textcircled{~}}$)
 Omitted = unchanged

EDITMARGINS See TEKSTBM

EL ERASE-IN-LINE

§15 Dialog Area

Erases a specified part of the active line.

Syntax

ANSI: $\text{\textcircled{c}}[$ Ps: *erase-extent* **K**

Setup: None

Parameters

erase-extent

Specifies how much to erase and whether to erase all characters or only erasable ones.

0	Erase characters from the active position to the end of the active line.
1	Erase characters from the beginning of the active line to the active position.
2	Erase the entire line.
?0	Erase all erasable characters from the active position to the end of the active line.
?1	Erase all erasable characters from the beginning of the active line to the active position.
?2	Erase all erasable characters in the active line.
Defaults:	After FACTORY = (none) Omitted = 0

EMI *ENABLE-MANUAL-INPUT**§10 Keyboards*

Unlocks the keyboard.

Syntax

ANSI: $\text{E}_c \text{ b}$

Setup: See LOCKKEYBOARD

Parameters

None

ENABLE-4010-GIN *ENABLE-4010-GIN**§20 Graphic Input*

Enables the Locator GIN function on GIN device 0 for a single 4010-GIN report.

Syntax

Tek: $\text{E}_c \text{ S}_B$

Setup: None

STI: LLGN10

Parameters

None

ENCODE *ENCODE**§5 Programming Services*

Converts parameters into host syntax and displays the result to the user.

Syntax

Setup: **ENCODE** keyword: *parameter-type*
 delim-string: *parameter-data*

Parameters*parameter-type*

Defines what type of numeric parameter the string represents. The allowable *keywords* are:

INT	The string contains an <i>int</i> parameter
REAL	The string contains a <i>real</i> parameter
XY	The string contains a <i>12-bit-xy</i> parameter
32XY	The string contains a <i>32-bit-xy</i> parameter
4010XY	The string contains a <i>4010 xy</i> parameter
Defaults:	After FACTORY = (none) Omitted = Error

parameter-data

The string to be encoded. The string must be delimited.

Defaults: After FACTORY = (none)
 Omitted = Error

ENDFILLPATTERN END-FILL-PATTERN

§16 Pixel Operations

Terminates a *fill-pattern-definition*.

Syntax

Tek: \mathbb{E}_c ME
Setup: ENDFILLPATTERN
STI: LLEFIL

Parameters

None

ENDPANEL END-PANEL

§18 Graphics Primitives

Terminates a panel-definition, closing the current panel boundary and setting the 2-D graphics position to the *first-point* of the panel boundary.

Syntax

Tek: \mathbb{E}_c LE
Setup: ENDPANEL
STI: LLEPNL

Parameters

None

ENQ ENQUIRY

§6 Reports

Causes the answerback message to be sent to the host.

Syntax

Tek: \mathbb{E}_Q
ANSI: Same as Tek.
VT52: Same as Tek.

Parameters

None

ENTER-ALPHA-MODE

ENTER-ALPHA-MODE

§4 Command Syntax

Puts the graphics system in Alpha mode.

Syntax

Tek: \mathbb{U}_s
STI: LLAMOD

Parameters

None

ENTER-ALTERNATE-KEYPAD-MODE

ENTER-ALTERNATE-KEYPAD-MODE

§10 Keyboards

Puts the graphics system in Keypad Application Mode, like the ANSI mode TEKKPAM command.

Syntax

VT52: $\text{E}_C =$

Parameters

None

ENTER-ANSI-MODE

ENTER-ANSI-MODE

§4 Command Syntax

Puts the graphics system in ANSI mode.

Syntax

VT52: $\text{E}_C <$

Parameters

None

ENTER-BYPASS-MODE

ENTER-BYPASS-MODE COMMAND

§9 Host Communications

Causes the graphics system to ignore all characters received through the host port (logical device HO:).

Syntax

Tek: $\text{E}_C \text{C}_N$

Setup: None

STI: LLBYPs

Parameters

None

ENTER-GRAPHICS-MODE

ENTER-GRAPHICS-MODE

§14 Text

Selects the Rulings character set as the G0 character set.

Syntax

VT52: $\text{E}_C \text{F}$

Parameters

None

ENTER-MARKER-MODE

ENTER-MARKER-MODE

§4 Command Syntax

Puts the graphics system in Marker mode.

Syntax

Tek: \mathbb{P}_s

STI: LLMMOD

Parameters

None

ENTER-VECTOR-MODE

ENTER-VECTOR-MODE

§4 Command Syntax

Puts the graphics system in Vector mode and sets the internal move/draw flag to move.

Syntax

Tek: \mathbb{Q}_s

STI: LLVMOD

Parameters

None

EOFSTRING SET-EOF-STRING

§9 Host Communications

Sets *EOF-string* (end-of file string) for the host.

Syntax

Tek: \mathbb{P}_{cNE} int-array: *EOF-string*

Setup: EOFSTRING delim-string: *EOF-string*

STI: LLEOF (*length, EOF-string*)

Parameters

EOF-string (length 0 through 10)

Specifies the string that marks the end of a file being sent to or from the host port. Valid values are 0 to 127.

Defaults: After FACTORY = empty array
Omitted = empty array

EOLSTRING SET-EOL-STRING

§9 Host Communications

Sets the end-of-line (EOL) string for the host.

Syntax

Tek: \mathbb{P}_{cNT} int-array: *EOL-string*

Setup: EOLSTRING delim-string: *EOL-string*

STI: LLEOL (*length, EOL-string*)

Parameters

EOL-string (length 0 through 2)

0 to 127 Specifies the characters that make up the end-of-line string for the host port.

Defaults: After FACTORY = 13 (\mathbb{Q}_R character)
Omitted = empty array

EOMCHARS *SET-EOM-CHARS*

§9 Host Communications

Specifies or deletes the end-of-message (EOM) characters for the host.

Syntax

Tek: E_cNC int: *EOM-char-1*
 int: *EOM-char-2*

Setup: **EOMCHARS** char: *EOM-char-1*
 char: *EOM-char-2*

STI: **LLEOM** (*EOM-char-1, EOM-char-2*)

Parameters*EOM-char-1*

A character that marks the end of a line of text in data sent to the host computer.

0 No character.

1 to 127 Specifies an EOM character.

Defaults: After FACTORY = 13 (C_R character)
 Omitted = 0

EOM-char-2

An alternate character to mark the end of a line of text in data sent to the host computer.

0 No character.

1 to 127 Specifies an alternate EOM character.

Defaults: After FACTORY = 0
 Omitted = 0

ERASE-TO-END-OF-LINE

*ERASE-TO-END-OF-LINE**§15 Dialog Area*

Erases all characters from the active position to the end of the current line.

Syntax

VT52: E_cK

Parameters

None

ERASE-TO-END-OF-SCREEN

*ERASE-TO-END-OF-SCREEN**§15 Dialog Area*

Erases from the active position to the end of the screen.

Syntax

VT52: E_cJ

Parameters

None

ERRORLEVEL *SET-ERROR-THRESHOLD*

§5 Programming Services

Sets the minimum severity level for displayed error messages.

Syntax

Tek: E_c KT int: *error-threshold-level*
Setup: **ERRORLEVEL** integer: *error-threshold-level*
STI: **LLERTH** (*error-threshold-level*)

Parameters

error-threshold-level

Specifies minimum error severity for error message to be displayed.

- 0 Level 0 to 3 error messages are displayed.
- 1 Level 1 to 3 error messages are displayed.
- 2 Level 2 to 3 error messages are displayed.
- 3 Level 3 error messages are displayed.
- 4 No error messages are displayed.

Defaults: After FACTORY = 2
 Omitted = 0

ESC *ESCAPE*

§4 Command Syntax

Introduces commands in all command syntaxes.

Syntax

Tek: E_c
ANSI: Same as Tek.
VT52: Same as Tek.
Setup: Same as Tek.
STI: None

Parameters

None

EXIT-ALTERNATE-KEYPAD-MODE

EXIT-ALTERNATE-KEYPAD-MODE

§10 Keyboards

Removes the graphics system from Keypad Application mode and places it in Keypad Numeric mode, the same as the ANSI mode TEKPNM command.

Syntax

VT52: E_c >

Parameters

None

EXIT-GRAPHICS-MODE

EXIT-GRAPHICS-MODE

§14 Text

Restores the G0 character set that was in effect before the current ENTER-GRAPHICS-MODE command was issued.

Syntax

VT52: E_c G

Parameters

None

EXPAND *EXPAND**§7 Macros*

Expands a Tek macro.

Syntax

Tek: E_cKX key-specifier: *macro-number*
 Setup: **EXPAND** key-specifier: *macro-number*
 STI: **LLEMAC** (*macro-number*)

Parameters*macro-number*

The number of the macro whose definition is being invoked.

–32768 to –32513 Byte macros
 –861 to –2 Key macros
 0 to 143 Key macros
 144 to 32767 Host macros
 Any character (Setup) Key macros 0 to 127
 F1 to F8 (Setup) Key macros 128 to 135
 S1 to S8 (Setup) Key macros 136 to 143
 Defaults: After **FACTORY** = (none)
 Omitted = 0

FACTORY *FACTORY**§3 System Initialization*

Sets all parameters to their factory default values and takes the graphics system out of Setup.

Syntax

Setup: **FACTORY**

Parameters

None

FF *FORM-FEED**§14 Text*

Inserts a Form Feed character into the dialog buffer.

Syntax

Tek: F_F
 ANSI: F_F
 VT52: F_F
 STI: None

Parameters

None

FILLPATTERN *SELECT-FILL-PATTERN**§18 Graphics Primitives*

Selects the pattern used to fill the interior of panels.

Syntax

Tek: E_cMP int: *fill-pattern-number*
 Setup: **FILLPATTERN** integer: *fill-pattern-number*
 STI: **LLSFIL** (*fill-pattern-number*)

Parameters*fill-pattern-number*

Specifies a fill pattern.

–32768 to –256 Transparent fill (not filled)
 –255 to 0 Color indices
 1 to 16 Predefined fill pattern (texture pattern)
 17 to 49 Application-defined fill pattern
 50 to 174 Predefined fill patterns (dithered colors)
 175 to 32767 Application-defined fill patterns

Defaults: After **FACTORY** = –1
 Omitted = 0

FIXUP *SET-FIXUP-LEVEL**§19 Segments*

Controls the type of action taken for operations which modify graphics in the current view.

Syntax

Tek: E_cRF int: *fixup-level*
 Setup: **FIXUP** integer: *fixup-level*
 STI: **LLFXUP** (*fixup-level*)

Parameters*fixup-level*

Specifies when and how modifications are made to the graphics in the graphics area. Has no effect on pixel operations. Input of any value other than 0, 2, 4, or 6 will not result in an error, however, the next lower *fixup-level* to the value selected will be used. For example if you select a *fixup-level* of 5, the graphics system will set the *fixup-level* to 4.

- | | |
|---|--|
| 0 | No graphic primitives are drawn or erased. Modifications to segments are performed internally, but no updates are made to the display. Non-retained graphics are not displayed and are lost. At fixup-level 0, the screen is only updated when a RENEW or PAGE command is executed, when the GEras key or SEras key is pressed, or when a viewing function causes the entire view to be redrawn. |
| 2 | Modifications to segments are performed internally, as in fixup-level 0. Changes which involve <i>additions</i> to the current view are displayed immediately. Changes which cause segments to be <i>erased</i> are not performed. (When a segment is moved at Fixup Level 2, for example, it is drawn in the new position, but not erased from the old position.) |
| 4 | Internal modifications, and additions to the screen are performed as in Fixup Level 2. Changes which involve <i>erasing</i> a segment drawn in <i>XOR mode</i> are performed as well. Segments displayed in other writing modes are treated as in Fixup Level 2. |

- | | |
|---|--|
| 6 | This is the default fixup level. Internal modifications, additions, and XOR erasures are performed as in fixup level 4. Changes which involve <i>erasing</i> a segment drawn in other writing modes are performed. |
|---|--|

Defaults: After FACTORY = 6
 Omitted = 0

FLAGGING *SET-FLAGGING-MODE**§9 Host Communications*

Sets the flagging protocol between the RS-232 host port and the host computer.

Syntax

Tek: E_cNF int: *flagging-mode*
 Setup: **FLAGGING** keyword: *flagging-mode*
 STI: **LLFLAG** (*flagging-mode*)

Parameters*flagging-mode*

Specifies whether flagging occurs between the graphics system and the host, and if flagging occurs, what type.

- | | |
|-----------|---|
| 0 | No flagging (Setup: NONE). |
| 1 | DC1/DC3 flagging when receiving data from the host (Setup: INPUT). |
| 2 | DC1/DC3 flagging when transmitting to the host (Setup: OUTPUT). |
| 3 | DC1/DC3 flagging both when transmitting and when receiving (Setup: IN/OUT). |
| 4 | Flagging with the DTR (Data Terminal Ready) and CTS (CLEAR TO SEND) RS-232-C signal lines (Setup: DTR/CTS). |
| Defaults: | After FACTORY command = 0
Omitted = 0 |

GAMODE**SET-GRAPHICS-AREA-WRITING-MODE**

§18 Graphics Primitives

Selects the writing modes for text in the graphics area.

Syntax

Tek: $\text{\textcircled{E}}_c\text{MG}$ int: *writing-mode*

Setup: **GAMODE** keyword: *writing-mode*

STI: **LLGAWM** (*writing-mode*)

Parameters*writing-mode*

Specifies whether the background of alphanet and string-precision graphtext is filled, or whether stroke-precision graphtext is included into or called by segments.

- 0 Alphanet/string precision graphtext background is filled (Setup: **REPLACE**).
- 1 Alphanet/string-precision graphtext background is not filled (Setup: **OVERSTRIKE**).

Defaults: After **FACTORY** = 1
 Omitted = 0

GBACKGROUND**SET-BACKGROUND-GRAY-LEVEL**

§13 Colors, Surfaces

Specifies a gray level of the background color.

Syntax

Tek: $\text{\textcircled{E}}_c\text{RB}$ int: *gray-level*

Setup: **GBACKGROUND**
 integer: *gray-level*

STI: **LLBGGR** (*gray-level*)

Parameters*gray-level*

Specifies a gray level of the background color. Adding 1000 to *gray-level* causes the background to blink between the specified gray level and black.

RGB 0 to 100 or 1000 to 1100

CMY 0 to 100 or 1000 to 1100

HLS 0 to 100 or 1000 to 1100

Machine RGB 0 to 255 or 1000 to 1255

Defaults: After **FACTORY** = 0
 Omitted = 0

GINAREA SET-GIN-AREA

§20 Graphic Input

Associates a subset of GIN space to a view's window or to the current GIN window.

Syntax

Tek: \mathbb{R}_cIV int: *device-function*
 int: *view*
 xy+: *first-corner*
 xy+: *second-corner*

Setup: GINAREA integer: *device-function*
 integer: *view*
 xy+: *first-corner*
 xy+: *second-corner*

STI: LLARGN (*device-function, view, first-corner [x,y], second-corner [x,y]*)

Parameters

device-function

Specifies the GIN device for which the GIN area is defined, either -1 or in the form 8D+F, where D is 0 to 4 and 6 to 8, and F is 0, 1, or 2 (Locator, Pick, Stroke).

-1 All user defined GIN devices.

Defaults: After FACTORY = (none)
 Omitted = 0

view

Specifies the view that is to be current for GIN activity, and the window into which the GIN area is to map.

-1 The view currently selected by VSELECT and the window set by GINWINDOW.

0 The view currently selected by VSELECT and its window.

1 to 64 A particular view and its window.

Defaults: After FACTORY = -1
 Omitted = -1

first-corner

Specifies one corner of the GIN area, in GIN space. Valid values for x or y range from 0 to 4095.

Defaults: After FACTORY = (0,0)
 Omitted = (0,0)

second-corner

Specifies the other corner of the GIN area, in GIN space. Valid values for x or y range from 0 to 4095.

Defaults: After FACTORY = (4095,4095)
 Omitted = (4095,4095)

GINCURSOR SET-GIN-CURSOR

§20 Graphic Input

Selects a segment for use as the GIN cursor, and assigns it to a GIN device and function.

Syntax

Tek: \mathbb{R}_cIC int: *device-function*
 int: *segment-number*

Setup: GINCURSOR integer: *device-function*
 integer: *segment-number*

STI: LLCRGN (*device-function, segment-number*)

Parameters

device-function

Specifies the GIN device, *D*; and GIN function, *F*; in the form 8D+F.

Valid values for *D* are:

0 to 4 and 6 to 8

Valid values for *F* are:

0 Locator
 1 Pick
 2 Stroke

Defaults: After FACTORY = all default GIN devices
 Omitted = 0

segment-number

Specifies the number of the segment selected for use as GIN cursor. Valid values are:

0 The crosshair cursor
 1 to 32767 A segment

Defaults: After FACTORY = 0
 Omitted = 0

GINDISABLE *DISABLE-GIN**§20 Graphic Input*

Disables a specific function on a specific GIN device, or all functions on all devices.

Syntax

Tek: **%cID** int: *device-function*

Setup: **GINDISABLE** integer: *device-function*

STI: **LLDSGN** (*device-function*)

Parameters*device-function*

Specifies the GIN device (*D*) and GIN function (*F*), in the form $8D+F$; -1 specifies all functions on all devices.

Valid values for *D* are:

0 to 4 and 6 to 8

Valid values for *F* are:

0 Locator
1 Pick
2 Stroke

Defaults: After FACTORY = (none)
 Omitted = 0

GINENABLE *ENABLE-GIN**§20 Graphic Input*

Enables a GIN function on a GIN device, determines whether key-releases are allowed as triggers, and specifies how many GIN reports are sent to the host.

Syntax

Tek: **%cIE** int: *GIN-code*
 int: *GIN-count*

Setup: **GINENABLE** integer: *GIN-code*
 integer: *GIN-count*

STI: **LLENGN** (*GIN-code, GIN-count*)

Parameters*GIN-code*

Specifies the GIN device, *D*; GIN function, *F*; and trigger mode, *M*; to be enabled. Specified in the form $2048M+8D+F$.

Valid values for *M* are:

0 Only key-press triggers allowed.
1 Both key-press and key-release triggers allowed.

Valid values for *D* are:

0 to 4 and 6 to 8

Valid values for *F* are:

0 Locator
1 Pick
2 Stroke

Defaults: After FACTORY = (none)
 Omitted = 0

GIN-count

Specifies the number of GIN reports sent before the GIN device is automatically disabled. Valid values are 0 to 65535; 0 enables GIN until it is explicitly disabled.

Defaults: After FACTORY = (none)
 Omitted = 0

GINFILTER *SET-GIN-STROKE-FILTERING**§20 Graphic Input*

Sets the time and distance filters applied to GIN space data for the the Stroke GIN function.

Syntax

Tek: ^cIF int:*device-function*
 int:*distance-filter*
 int:*time-filter*

Setup: GINFILTER integer: *device-function*
 integer: *distance-filter*
 integer: *time-filter*

STI: LLTBSF (*device-function, distance-filter, time-filter*)

Parameters*device-function*

Specifies a GIN device (*D*) and a GIN function (*F*), in the form 8*D*+*F*.

Valid values for *D* are:
 0 to 4 and 6 to 8

Valid values for *F* are:
 0 Locator
 1 Pick
 2 Stroke

Defaults: After FACTORY = (none)
 Omitted = 0

distance-filter

Specifies the minimum change in the absolute GIN space value required before another automatic trigger can be sent. Valid values are 0 to 4095.

Defaults: After FACTORY = 0
 Omitted = 0

time-filter

Specifies the minimum time in milliseconds required to pass before another automatic trigger can be sent. Valid values are 0 to 32767.

Defaults: After FACTORY = 0
 Omitted = 0

GINFORMAT *SET-GIN-REPORT-FORMAT**§20 Graphic Input*

Controls the format and number of *GIN-reports* sent to the host for each Pick operation, and whether the view number is included in Locator, Pick, and Stroke GIN reports.

Syntax

Tek: ^cIK int: *GIN-report-format*

Setup: GINFORMAT integer: *GIN-report-format*

STI: LLSTPP (*GIN-report-format*)

Parameters*GIN-report-format*

Specifies the format of GIN reports. Valid parameter values and their meanings are shown in the following table:

Parameter	Bits	Pick Report Format	No. of GIN Reports	View in Report?
0	000	2 int-reports	one	no
1	001	int-array-report	one	no
2	010	2 int-reports	multiple	no
3	011	int-array-report	multiple	no
4	100	2 int-reports	one	yes
5	101	int-array-report	one	yes
6	110	2 int-reports	multiple	yes
7	111	int-array-report	multiple	yes

Defaults: After FACTORY = 0
 Omitted = 0

GINGRIDDING *SET-GIN-GRIDDING*

§20 Graphic Input

Defines an invisible grid that constrains the GIN cursor to points on the grid.

Syntax

Tek: **%cIG** int: *device-function*
 int: *x-spacing*
 int: *y-spacing*

Setup: **GINGRIDDING**
 integer: *device-function*
 integer: *x-spacing*
 integer: *y-spacing*

STI: **LLGRGN** (*device-function, x-spacing, y-spacing*)

Parameters*device-function*

Specifies a GIN device (*D*) and a GIN function (*F*), in the form $8D+F$.

Valid values for *D* are:
 0 to 4 and 6 to 8

Valid values for *F* are:
 0 Locator
 1 Pick

Defaults: After FACTORY = (none)
 Omitted = 0

x-spacing

Specifies horizontal grid spacing in world space units.
 Valid values are 0 to $2^{31} - 1$.

Defaults: After FACTORY = (none)
 Omitted = 0

y-spacing

Specifies vertical grid spacing in world space units.
 Valid values are 0 to $2^{31} - 1$.

Defaults: After FACTORY = (none)
 Omitted = 0

GININKING *SET-GIN-INKING*

§20 Graphic Input

Turns the inking feature on or off.

Syntax

Tek: **%cII** int: *device-function*
 int: *inking-mode*

Setup: **GININKING**
 integer: *device-function*
 integer: *inking-mode*

STI: **LLIKGN** (*device-function, inking-mode*)

Parameters*device-function*

Specifies a GIN device (*D*) and a GIN function (*F*), in the form $8D+F$.

Valid values for *D* are:
 0 to 4 and 6 to 8

Valid values for *F* are:
 0 Locator
 2 Stroke

Defaults: After FACTORY = (none)
 Omitted = 0

inking-mode

Specifies whether inking is off or on, and if on, where inking starts.

0 Off
 1 On – for a line that starts at first GIN point
 2 On – for a line that starts from *GIN-display-start-point*
 3 On – for a rectangle that starts at first GIN point
 4 On – for a rectangle that starts from *GIN-display-start-point*

Defaults: After FACTORY = 0
 Omitted = 0

GINMAPDEVICE *MAP-GIN-DEVICE**§20 Graphic Input*

Maps the Arrow Keys, Mouse, or Thumbwheels onto GIN device 0.

Syntax

Tek: **IB** int: *GIN-device*
 int-array: *physical-axis-list*
 int-array: *trigger-list*
 int-array: *general-attributes*
 int-array: *GIN-views*

Setup: **GINMAPDEVICE**
 integer: *GIN-device*
 integer-array: *physical-axis-list*
 integer-array: *trigger-list*
 integer-array: *general-attributes*
 integer-array: *GIN-views*

STI: **LLMGIN** (*GIN-device, length, physical-axis-list, length, trigger-list, length, general-attributes, length, GIN-views*)

Parameters*GIN-device*

Specifies the GIN device to be mapped. The only valid value is 0.

Defaults: After FACTORY = 0
 Omitted = 0

physical-axis-list (length 2)

Specifies which device controls the horizontal and vertical axes of GIN cursor movement. Must be one of the following:

<1,2> Arrows keys control horizontal and vertical axes
 <5,6> Mouse or Thumbwheels controls horizontal and vertical axes

Defaults: After FACTORY = <1,2>
 Omitted = Error IB21

trigger-list (length 3 or 4)

Specifies whether Mouse buttons can trigger GIN reports (three required array elements, -32509, -32510, and -32511, specify that alphanumeric keys, function keys, and keypad keys can generate GIN reports). Must be one of the following:

<-32509,-32510,-32511>
 Mouse buttons cannot trigger GIN reports
 <-32507,-32509,-32510,-32511>
 Mouse buttons can trigger GIN reports

Defaults: After FACTORY =
 <-32509,-32510,-32511>
 Omitted = Error IB31

general-attributes (length 4)

Specifies device priority (as well as three other parameters included for compatibility with other Tektronix terminals). Must be one of the following:

<2,1,1,1> Device priority 2 (use when mapping arrow keys to device 0)
 <3,1,1,1> Device priority 3 (use when mapping Mouse to device 0)

Defaults: After FACTORY = <2,1,1,1>
 Omitted = Error IB41

GIN-views (length 0 to 64)

Specifies the GIN view in which GIN actions will take place. The only valid value is 0, which selects the default GIN view (the current view). This parameter is supported to provide compatibility with other Tektronix terminals.

Defaults: After FACTORY = 0 (no change)
 Omitted = 0 (no change)

GINPICKAPERTURE*SET-PICK-APERTURE**§20 Graphic Input*

Sets the width and height of the pick aperture.

Syntax

Tek: **IA** int: *aperture-size*
 Setup: **GINPICKAPERTURE**
 integer: *aperture-size*
 STI: **LLPKAP** (*aperture-size*)

Parameters*aperture-size*

Specifies the dimension used for the width and height of the pick aperture. Valid values are 0 to 4095.

Defaults: After FACTORY = 8
 Omitted = 0

GINRATES *SET-GIN-RATES**§20 Graphic Input*

Controls the rates tables for the physical device motion axes.

Syntax

Tek: $\text{E}_{\text{c}}\text{IU}$ int-array: *rate-table*
 Setup: **GINRATES** integer-array: *rate-table*
 STI: **LLGNRT** (*length, rate-table*)

Parameters

rate-table (length 0 to a maximum depending on element 1)
 Specifies a physical device's rates table(s).

First element: Specifies the physical device.

- 0 Thumbwheel/mouse; max length 10.
- 6 Tablet on P0;; max length 10.
- 7 Tablet on P1;; max length 10.
- 8 Same as 0.

Second element: Depends on first element.

For first element 0 and 8:

- 0 Thumbwheels/mouse rates tables.

For first elements 6 and 7:

- 0 Relative tablet rates tables.

Remaining elements: depends on first element.

For first elements 0, 6, 7, and 8:

Rates values 0 to 4095

Defaults: After **FACTORY**
 for the thumbwheels/mouse = 200, 400,
 600, 800, 1000, 1200, 1400, 1600, 1800,
 2000, 2200, 2400.
 for the Graphic Tablet = 16, 32, 48, 64,
 80, 96, 112, 128, 144, 160, 176, 192.
 Omitted = no change

GINRUBBERBAND*SET-GIN-RUBBERBANDING**§20 Graphic Input*

Turns rubberbanding on or off for the specified GIN device and the Locator GIN function.

Syntax

Tek: $\text{E}_{\text{c}}\text{IR}$ int: *device-function*
 int: *rubberbanding-mode*
 Setup: **GINRUBBERBAND**
 integer: *device-function*
 integer: *rubberbanding-mode*
 STI: **LLRBGN** (*device-function, rubberbanding-mode*)

Parameters

device-function

Specifies a GIN device (*D*) and a GIN function (*F*) in the form $8D+F$.

Valid values for *D* are:

- 0 to 4 and 6 to 8

Valid values for *F* are:

- 0 Locator

Defaults: After **FACTORY** = all default GIN devices
 Omitted = 0

rubberbanding-mode

Specifies whether *rubberbanding-mode* is off or on, and if on, where rubberbanding starts. Valid values are:

- 0 Off
- 1 On for a line that starts at first GIN point.
- 2 On for a line that starts at *GIN-display-start-point*.
- 3 On for a rectangle that starts at first GIN point.
- 4 On for a rectangle that starts at *GIN-display-start-point*.

Defaults: After **FACTORY** = 0
 Omitted = 0

GINSTARTPOINT

SET-GIN-DISPLAY-START-POINT

§20 Graphic Input

Specifies the point at which inking and rubberbanding will start.

Syntax

Tek: \mathbb{R}_cIX int: *device-function*
 xy+: *start-point*

Setup: GINSTARTPOINT
 integer: *device-function*
 xy+: *start-point*

STI: LLSPGN (*device-function, start-point* [x,y])

Parameters

device-function

Specifies a GIN device (*D*) and a GIN function (*F*) in the form 8*D*+*F*.

Valid values for *D* are:
0 to 4 and 6 to 8

Valid values for *F* are:
0 Locator
2 Stroke

Defaults: After FACTORY = (none)
 Omitted = 0

start-point

Specifies the point at which inking and rubberbanding will start. All valid xy+ values are valid for this command.

Defaults: After FACTORY = 0,0
 Omitted = 0,0

GINWINDOW

SET-GIN-WINDOW

§20 Graphic Input

Creates a window in world space for use by the GINAREA command.

Syntax

Tek: \mathbb{R}_cIW
xy+: *first-corner*
xy+: *second-corner*

Setup: GINWINDOW
 xy+: *first-corner*
 xy+: *second-corner*

STI: LLWIGN
 (*first-corner* [x,y], *second-corner*
 [x-value, y-value])

Parameters

first-corner

Specifies a corner of a window in world space onto which a GIN area can be mapped. Valid values are all xy+ values.

Defaults: After FACTORY = (0,0)
 Omitted = (0,0)

second-corner

Specifies the opposite corner of the window. Valid values are all xy+ values.

Defaults: After FACTORY = (4095,4095)
 Omitted = (0,0)

GRAY *SET-SURFACE-GRAY-LEVELS**§13 Colors, Surfaces*

Assigns gray levels to color indices on a surface.

Syntax

Tek: [®]cRG int: *surface-number*
 int-array: *indices-and-gray-levels*

Setup: **GRAY** integer: *surface-number*
 integer-array: *indices-and-gray-levels*

STI: **LLGRSF** (*surface-number, length, indices-and-gray-levels*)

Parameters*surface-number*

This parameter specifies the surface for which gray-levels are being assigned. Valid values are:

-1 Super surface

1 — 8

Defaults: After FACTORY = 1
 Omitted = Error RG11 (Level 2)

indices-and-gray-levels (length 0 to 32768, even)

The integer values in this array are considered in pairs. The first integer in each pair specifies a color index of 0 to 255. The second integer in the pair specifies the gray level for that color index. Adding 1000 to the gray-level causes the gray-level to blink. The valid gray-levels are:

RGB 0 to 100 or 1000 to 1100

CMY 0 to 100 or 1000 to 1100

HLS 0 to 100 or 1000 to 1100

Machine RGB 0 to 255 or 1000 to 1255

Defaults: After FACTORY = Factory default colors
 Omitted = No change

GRESOLUTION *GRAPHICS-RESOLUTION**§3 System Initialization*

Specifies the resolution of IBM-style graphics to be processed by the graphics system during coax communications. Requires Coax Option (Option CX).

Syntax

Setup: **GRESOLUTION** keyword: *resolution*

Parameters*resolution*

Specifies the graphics system's screen resolution.

STANDARD Specifies that IBM-style graphics will be processed using the graphics system's screen resolution.

HIGH Specifies that IBM-style graphics will be processed at twice screen resolution (as if the screen had twice as many pixels in both x- and y- directions).

Defaults: After FACTORY = HIGH
 Omitted = HIGH

GSPEED *SET-GIN-CURSOR-SPEED**§20 Graphic Input*

Determines the speed of the GIN cursor on the screen when manipulated by the cursorpad.

Syntax

Tek: [®]cIJ int: *normal-speed*
 int: *shifted-speed*

Setup: **GSPEED** *normal-speed*
 shifted-speed

STI: **LLGSPD** (*normal-speed, shifted-speed*)

Parameters*normal-speed*

Determines the speed of the GIN cursor when the cursorpad is pressed. Valid range is 0 to 65535 (values greater than 12 default to 12, and 0 defaults to 1).

Defaults: After FACTORY = 8
 Omitted = 1

Command Summary

shifted-speed

Determines the speed of the GIN cursor when the Shift key and cursorpad are pressed simultaneously. Valid range is 0 to 65535 (values greater than 12 default to 12, and 0 defaults to 1).

Defaults: After FACTORY = 4
Omitted = 1

GTBEGIN *BEGIN-GRAPHTEXT-CHARACTER*

§14 Text

Introduces the definition of a application-defined stroke-precision graphtext character.

Syntax

Tek: E_cST int: *font*
 int: *character*

Setup: GTBEGIN integer: *font*
 integer: *character*

STI: LLBGCH (*font, character*)

Parameters

font

Specifies the stroke font in which the character is being defined. Valid values are 0 to 32767, plus 32768 and 32769 if Sony/Tek Option 4L is installed.

Defaults: After FACTORY = (none)
Omitted = 0

character

Specifies the ASCII decimal equivalent of the character being defined. Valid values are 32 to 126 and 160 to 254 for Fonts 0 to 32767. For Fonts 32768 and 32769, valid values are of the form $A*256+B$ where A and B are 33 to 126.

Defaults: After FACTORY = (none)
Omitted = Error ST21

GTDELETE

DELETE-GRAPHTEXT-CHARACTER

§14 Text

Deletes the named user-defined character from the specified graphtext font.

Syntax

Tek: E_cSZ int: *font*
 int: *character*

Setup: GTDELETE integer: *font*
 integer: *character*

STI: LLDGCH (*font, character*)

Parameters

font

Specifies the font from which the character is deleted. Valid values are:

-1 All fonts

0 to 32767 A user-defined font

32768, 32769 A user-defined font (Sony/Tek Option 4L)

Defaults: After FACTORY = (none)
Omitted = 0

character

Specifies the ASCII decimal equivalent of the character, or -1 for all characters in the font. Valid values are -1 and 32 to 126 for fonts 0 to 32767. For fonts 32768 and 32769, valid values are of the form $A*256+B$ where A and B are 33 to 126.

Defaults: After FACTORY = (none)
Omitted = Error SZ21

GTEND *END-GRAPHTEXT-CHARACTER**§14 Text*

Terminates the stroke-precision graphtext character currently being defined.

Syntax

Tek: $\text{\textcircled{E}}\text{cSU}$
 Setup: GTEND
 STI: LLEGCH

Parameters

None

GTEXT *GRAPHIC-TEXT**§14 Text*

Displays graphtext characters.

Syntax

Tek: $\text{\textcircled{E}}\text{cLT}$ char-array: *text-string*
 Setup: GTEXT delim-string: *text-string*
 STI: LLTEXT (*length, text-string*)

Parameters

text-string (length 0 through 65535)

Specifies the characters to be displayed. Valid elements have ASCII decimal values in the range 32 to 127 and 160 to 255.

Defaults: After FACTORY = none
 Omitted = empty string

GTFONT *SET-GRAPHTEXT-FONT**§14 Text*

Determines which graphtext font will be used to display subsequent stroke-precision graphtext.

Syntax

Tek: $\text{\textcircled{E}}\text{cMF}$ int: *font-number*
 Setup: GTFONT integer: *font-number*
 STI: LLGFNT (*font-number*)

Parameters*font-number*

Specifies the graphtext font that will be used to display subsequent stroke-precision graphtext. Valid values are 0 to 32767. The predefined fonts are:

0	North American (ASCII)
1	Swedish
2	German
3	United Kingdom
9	Danish/Norwegian
10	JIS-Roman
11	JIS-Katakana
12	French
14	Spanish
15	Italian
32768	Kanji (Option 4L)

Defaults: After FACTORY = 0 (North American)
 Omitted = 0

NOTE

For compatibility with existing Tektronix terminals and future firmware releases, avoid using low font numbers for application-defined graphtext fonts. Font numbers 4, 5, 6, and 8 are reserved for graphtext fonts already used by other Tektronix terminals, and any new fonts added in future firmware releases will use font numbers contiguous with the numbers already in use.

GTGRID SET-GRAPHTEXT-FONT-GRID

§14 Text

Creates a stroke-precision graphtext font and specifies the dimensions of the grid (character cell) used for characters in the font.

Syntax

Tek: $\text{\textcircled{E}}_{\text{c}}\text{SG}$ int: *font-number*
 int: *grid-width*
 int: *grid-height*

Setup: GTGRID integer: *font-number*
 integer: *grid-width*
 integer: *grid-height*

STI: LLGGRD (*font-number, grid-width, grid-height*)

Parameters

font-number

Specifies the graphtext font for which a font grid is being defined. Valid values are 0 to 32767, plus 32768 and 32769 if Sony/Tek Option 4L is installed.

0 to 32767 Specifies a graphtext font number.

Defaults: After FACTORY = (none)
 Omitted = 0

grid-width

Specifies the width of the font grid.

1 to 4095 Specifies the width of the font grid in modeling space units.

Defaults: After FACTORY = (none)
 Omitted = Error SG21 (Level 2)

grid-height

Specifies the height of the grid.

1 to 4095 Specifies the height of the font grid in modeling-space units.

Defaults: After FACTORY = (none)
 Omitted = Error SG31 (Level 2)

GTINDEX SET-TEXT-INDEX

§18 Graphics Primitives

Specifies the color index used for subsequent graphtext and alphanet in the graphics area.

Syntax

Tek: $\text{\textcircled{E}}_{\text{c}}\text{MT}$ int: *text-index*

Setup: GTINDEX integer: *text-index*

STI: LLTXIN (*text-index*)

Parameters

text-index

Specifies the color index used for subsequent alphanet and graphtext.

0 to 32767 A specific color index or color range

Defaults: After FACTORY = 1
 Omitted = 0

GTPATH *SET-GRAPHTEXT-CHARACTER-PATH**§18 Graphics Primitives*

Specifies the direction in which stroke-precision graphtext is written with respect to the rotation angle.

Syntax

Tek: $\text{\textcircled{c}}\text{MN}$ int: *direction*
 Setup: **GTPATH** keyword: *direction*
 STI: **LLCHPA** (*direction*)

Parameters*direction*

Specifies how a stroke-precision graphtext character is drawn relative to the graphics position, and where the new graphics position is located afterwards:

- 0 (Setup: **RIGHT**) Graphics position is at lower-left of the character cell. New graphics position is one character width plus the inter-character gap in the GTROTATION direction.
- 1 (Setup: **LEFT**) Graphics position is at lower-right of the character cell. New graphics position is one character width plus the inter-character gap in the GTROTATION plus 180 degree direction.
- 2 (Setup: **UP**) Graphics position is at bottom-center of the character cell. New graphics position is one character height plus the inter-character gap in the GTROTATION plus 90 degree direction.
- 3 (Setup: **DOWN**) Graphics position is at top-center of the character cell. New graphics position is one character height plus the inter-character gap in the GTROTATION plus 270 degree direction.

Defaults: After FACTORY = 0
 Omitted = 0

GTPRECISION*SET-GRAPHTEXT-PRECISION**§18 Graphics Primitives*

Specifies whether string precision or stroke precision is used to display graphtext characters.

Syntax

Tek: $\text{\textcircled{c}}\text{MQ}$ int: *precision*
 Setup: **GTPRECISION** keyword: *precision*
 STI: **LLGPCR** (*precision*)

Parameters*precision*

Specifies the precision type used for graphtext characters.

- 1 String precision (Setup: **STRING**).
 - 2 Stroke precision (Setup: **STROKE**).
- Defaults: After FACTORY = 2
 Omitted = Error MQ11 (Level 2)

GTROTATION *SET-GRAPHTEXT-ROTATION**§18 Graphics Primitives*

Specifies the rotation angle in degrees for stroke-precision graphtext.

Syntax

Tek: $\text{\textcircled{c}}\text{MR}$ real: *angle-in-degrees*
 Setup: **GTROTATION** real: *angle-in-degrees*
 STI: **LLGROT** (*angle-in-degrees*)

Parameters*angle-in-degrees*

Specifies the rotation angle in degrees. Positive angles represent counterclockwise rotations, while negative angles represent clockwise rotations from the x-axis. Valid range is -32767.0 to 32767.0.

Defaults: After FACTORY = 0.0
 Omitted = 0.0

GTSIZE SET-GRAPHTEXT-SIZE

§18 Graphics Primitives

Specifies the size of the character cell and inter-character spacing for subsequent stroke-precision graphtext.

Syntax

Tek: $\text{\textcircled{E}}_c\text{MC}$ int: *cell-width*
 int: *cell-height*
 int: *inter-character-spacing*

Setup: GTSIZE integer: *cell-width*
 integer: *cell-height*
 integer: *inter-character-spacing*

STI: LLGSIZ (*cell-width, cell-height, inter-character-spacing*)

Parameters

cell-width

Width of a graphtext character cell.

1 to $2^{31} - 1$ The width (in modeling space units) of the graphtext character cell.

Defaults: After FACTORY = 39
 Omitted = Error MC11 (Level 2)

cell-height

Height of a graphtext character cell.

1 to $2^{31} - 1$ The height (in modeling space units) of the graphtext character cell.

Defaults: After FACTORY = 52
 Omitted = Error MC21 (Level 2)

intercharacter-spacing

Spacing between adjacent character cells.

0 to $2^{31} - 1$ The intercharacter spacing (in modeling space units) for graphtext characters.

Defaults: After FACTORY = 13
 Omitted = 0

GTSLANT SET-GRAPHTEXT-SLANT

§18 Graphics Primitives

Specifies the slant from the vertical for subsequent stroke-precision graphtext characters.

Syntax

Tek: $\text{\textcircled{E}}_c\text{MA}$ real: *slant-angle*

Setup: GTSLANT real: *slant-angle*

STI: LLGSLT (*slant-angle*)

Parameters

slant-angle

Specifies the slant angle in degrees from the vertical for stroke-precision graphtext. Valid range is -32767.0 to 32767.0.

Defaults: After FACTORY = 0.0
 Omitted = 0.0

HARDCOPY *HARDCOPY**§11 Peripherals*

Copies the image on the screen or the text in the active dialog area's buffer to a hardcopy unit.

Syntax

Tek: E_c KH int: *hardcopy-code*
 Setup: **HARDCOPY** integer: *hardcopy-code*
 STI: **LLHCPY** (*hardcopy-code*)

Parameters*hardcopy-code*

Selects the type of hardcopy operation that is generated.

0 or 1	Screen copy with black and white reversed
2	Screen copy with no colors reversed
3	Dialog copy
Defaults:	FACTORY = (none) Omitted = 0

HCKBACKGROUND *BACKGROUND-COPY**§11 Peripherals*

Enables background copying and allocates memory for spooling background copies.

Syntax

Setup: **HCKBACKGROUND** keyword: *size*
 integer: *multiplier*

Parameters*size*

The amount of memory to reserve for background hardcopy spooling.

NONE	Disables background copying; frees memory
SIMPLE	Reserves 75Kb of memory for spooling
AVERAGE	Reserves 150Kb of memory for spooling
COMPLEX	Reserves 300Kb of memory for spooling
Defaults:	After FACTORY = NONE Omitted = Average

multiplier

Specifies how many units of memory specified by *size* to allocate for spooling. Must be in the range 0 through 32767.

Defaults:	After FACTORY = 1 Omitted = 1
-----------	----------------------------------

HCCHARSETS**SELECT-HARDCOPY-CHARACTER-SETS****§11 Peripherals**

Inform the graphics system which of its character sets are supported by the printer.

Syntax

Tek: $\text{\textasciix{c}QK}$ char-array: *character-set-specifier*
 Setup: **HCCHARSETS** delim-string: *character-set-specifier*
 STI: **LLHCCS** (length, *character-set-specifier*)

Parameters

character-set-specifier (length 0 to 32767)

Specifies the G-sets whose character-codes the attached printer is assumed to recognize. The array has the following form:

character-set-specifier = *G-set-specifier* [; *G-set-specifier* ...]

where: *G-set-specifier* = *Gn, size, Dscs*

where: *n* = 0, 1, 2, or 3

size = 94 or 96

Dscs = [*I*] [*I*] *F*

where: *I* = An ASCII character in the range 20 through 2F (hex)

F = An ASCII character in the range 30 through 7E (hex)

The *Dscs* part of a *G-set-specifier* is the same as the *Dscs* parameter used in a **SELECTCHARSET** command to designate a character set as one of the graphics system's G-sets. Here, however, it designates that character set as one of the printer's G-sets.

Defaults: After **FACTORY** =
 /G0,94,B;G1,94,3;G2,96,#0/
 Omitted = Error QK11 (Level 2)

HCCOPIES**SET-NUMBER-OF-COPIES****§11 Peripherals**

Sets the number of copies that are produced for hardcopy requests received by the graphics system via the **HARDCOPY** command, the 4010 **HARDCOPY** command, or the **SCopy/DCopy** key.

Syntax

Tek: $\text{\textasciix{c}QN}$ int: *number-of-copies*
 Setup: **HCCOPIES** integer: *number-of-copies*
 STI: **LLHCPS** (*number-of-copies*)

Parameters

number-of-copies

Selects the number of copies that are produced when a hardcopy is made. Valid range is from 0 through 32767.

Defaults: After **FACTORY** = 1
 Omitted = 1

HCDATTRIBUTES

SET-DIALOG-AREA-HARDCOPY-ATTRIBUTES

§11 Peripherals

Specifies the starting position, number of pages, and page-definition attributes for dialog copies initiated with the HARDCOPY command (or by the DCopy key when the keyboard's Tek functions are enabled).

Syntax

Tek: $\%cQL$ int: *number-of-pages*
 int: *page-origin*
 int: *page-definition*

Setup: HCDATTRIBUTES integer: *number-of-pages*
 integer: *page-origin*
 integer: *page-definition*

STI: LLDHCA (*number-of-pages, page-origin, page-definition*)

Parameters

number-of-pages

The number of pages to be printed starting at the origin.

- 0 No change.
- 1 to 32767 Number of pages to be printed.
- Defaults: After FACTORY = 1
 Omitted = 0

page-origin

Starting position for the number of pages to be printed.

- 0 Start at the first line in the dialog area viewport.
- 1 Start at first line in the dialog area buffer
- 2 Print last n pages of the dialog area buffer, where n is *number-of-pages*.
- Defaults: After FACTORY = 0
 Omitted = 0

page-definition

Specifies where page breaks occur.

- 0 Ignore Form Feed characters in text; use HCFEATURES *text-length*. Each dialog area page consists of the number of lines specified in the *text-length* parameter of HCFEATURES.

- 1 Use Form Feeds and HCFEATURES *text-length*. A dialog area page ends when a Form Feed character appears in the dialog area buffer or when the number of lines on the page has reached the maximum set by the *text-length* of HCFEATURES.
- 2 A dialog area page ends whenever a Form Feed character appears in the text.

NOTE

If a non-continuous form feed copier (such as the TEKTRONIX 4692) is used, setting *page-definition* to 2 is equivalent to setting it to 1.

Defaults: After FACTORY = 0
 Omitted = 0

HCDATARES

SET-COLOR-COPIER-DATA-RESOLUTION

§11 Peripherals

Specifies the color resolution of the data sent to a color copier during a screen copy (4692 only).

Syntax

Tek: $\%cQB$ int: *number-of-bytes*

Setup: HCDATARES integer: *number-of-bytes*

STI: LLHCDA (*number-of-bytes*)

Parameters

number-of-bytes

Specifies the precision of the color resolution of screen copies sent to a 4692 color copier.

- 1 One-byte color resolution
- 2 Two-byte color resolution

Defaults: After FACTORY = 2
 Omitted = Error QB11

HCDENSITY**SELECT-COLOR-HARDCOPY-IMAGE-DENSITY***§11 Peripherals*

Sets the number of dots per inch for color copies made on the 4692 color copier.

Syntax

Tek: $\text{\textcircled{E}}\text{cQU}$ int: *density-code*
 Setup: **HCDENSITY** integer: *density-code*
 STI: **LLHCID** (*density-code*)

Parameters*density-code*

Selects image density of copies made on a 4692.

- | | |
|-----------|--|
| 0 | Low density — 128 dots per inch (Setup: LOW) |
| 1 | High density — 154 dots per inch (Setup: HIGH) |
| Defaults: | After FACTORY = 1
Omitted = 1 |

HCDITHER**SET-COLOR-HARDCOPY-DITHERING***§11 Peripherals*

Specifies whether color dithering is used in making screen copies.

Syntax

Tek: $\text{\textcircled{E}}\text{cQM}$ int: *dither-code*
 Setup: **HCDITHER** keyword: *dither-code*
 STI: **LLHCDT** (*dither-code*)

Parameters*dither-code*

Sets the copier algorithms that will be used.

- | | |
|-----------|---|
| 0 | Dithering disabled (Setup: NO). |
| 1 | Dithering enabled (Setup: YES). |
| Defaults: | After FACTORY = 0
Omitted = 1 |

HCFEATURES**SET-HARDCOPY-FEATURES***§11 Peripherals*

Selects hardcopy system features.

Syntax

Tek: $\text{\textcircled{E}}\text{cQX}$ int-array: *features-list*
 Setup: **HCFEATURES** integer-array: *features-list*
 STI: **LLHCFT** (*length, features-list*)

Parameters

features-list (length 0 to 65535)

Specifies pairs of integers, each of which contains a *feature-number* and a *feature-value* for that feature. The length of the array must be an even number since the array contains pairs of integers.

feature-number

- | | |
|-----------|--|
| 1 | Selects <i>reserved-memory</i> for background copies. Valid <i>feature-values</i> are: |
| 0 | Releases memory previously reserved for background copying |
| 1 – 65535 | Reserves blocks of memory for background copying (1 copy block = 256 bytes) |
| 2 | Sets the <i>top-margin</i> (number of blank lines at the top of each page) for dialog copies made on continuous-feed copiers. Valid <i>feature-values</i> are 0 through 32767. |
| 3 | Sets the <i>bottom-margin</i> (number of blank lines at the bottom of each page) for dialog copies made on continuous-feed copiers. Valid <i>feature-values</i> are 0 through 32767. |
| 4 | Sets <i>text-length</i> (maximum number of lines of text per page) for dialog copies made on continuous-feed copiers. Valid <i>feature-values</i> are 0 through 32767. |

- | | |
|--|---|
| <p>5 Controls <i>paper-advance</i> for screen copies made on continuous-feed copiers. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 1 Advance paper between screen copies 0 Don't advance paper between screen copies <p>6 Selects the <i>image-rendering-mode</i>. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 0 Use printer default — that is, the front-panel settings for printers with the TPI interface, or eight-color clamp for non-TPI printers 1 Clamp to eight colors 2 Full-color dither 3 Full-color dither with enhanced blacks 4 Clamp to two colors (black and white) 5 Full-gray dither <p>7 Selects the <i>color-manipulation-mode</i> for printers with the TPI interface. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 0 Use printer default (that is the front-panel settings) 1 No manipulation 2 Use color matching 3 Use printer gamma correction <p>8 Selects the <i>color-conversion mode</i> for printers with the TPI interface. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 0 Use printer default (that is the front-panel settings) 1 No color conversion 2 Video gamma 2.8 3 Video gamma 2.2 4 Video gamma 2.4 5 Video gamma 2.6 | <p>9 Selects the <i>media-size</i> for printers with the TPI interface and for the Hewlett-Packard DeskJet and LaserJet. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 0 Use printer default (that is the front-panel settings) 1 Use whatever media size is loaded 2 Use A-size media 3 Use legal-size media 4 Use A4-size media 5 Use special A4-size media <p>10 Selects the <i>media-type</i> for printers with the TPI interface and for the TEKTRONIX ColorQuick Printer. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 0 Use printer default (that is the front-panel settings) 1 Use paper 2 Use transparency <p>11 Selects the <i>image-size</i> for printers with the TPI interface. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 0 Use printer default (that is the front-panel settings) 1 No change (pixels map one-to-one) 2 Replicate pixels to maximum size 3 Interpolate pixels to maximum size <p>12 Selects <i>pixel-inversion</i> for printers with the TPI interface. Valid <i>feature-values</i> are:</p> <ul style="list-style-type: none"> 0 Uses index inversion specified by the printer's front panel 1 Uses black-white inversion specified by the HARDCOPY command (or by the Ctrl/SCopy key combination) 2 Specifies "normal" copies (inverts black and white) 3 Specifies "true-rendition" copies, (does not invert black and white) <p>Defaults: After FACTORY = <1,0, 2,3, 3,3, 4,60 ,5,1, 6,0, 7,0, 8,0, 9,0, 10,0, 11,0, 12,1>
Omitted = no change</p> |
|--|---|

HCFORMWIDTH

SET-COLORHARDCOPY-FORM-WIDTH

§11 Peripherals

Sets the maximum width of the image on a 4696 color copier.

Syntax

Tek: $\text{\textcircled{E}}_c\text{QF}$ int: *form-width*

Setup: **HCFORMWIDTH** integer: *form-width*

STI: **LLHCFW** (*form-width*)

Parameters

form-width

- | | |
|-----------|--|
| 0 | 4696 copier media is 8-1/2 inches wide (960 dots). |
| 1 | 4696 copier media is 10 inches wide (1024 dots). |
| Defaults: | After FACTORY = 1
Omitted = 1 |

HCINTERFACE

SELECT-HARDCOPY-INTERFACE

§11 Peripherals

Selects the hardcopy interface and data format that is used for a hardcopy operation.

Syntax

Tek: $\text{\textcircled{E}}_c\text{QD}$ int: *copier-type*

Setup: **HCINTERFACE** integer: *copier-type*

STI: **LLHCIN** (*copier-type*)

Parameters

copier-type

Specifies which hardcopy interface and data format is used for a hardcopy operation. The valid range is 0 to 23.

- | | |
|---|--|
| 0 | Monochrome text-only printer at HC: (valid only for dialog copies). |
| 1 | Tektronix color copier at HC: (gives monochrome dialog copies on the 4696 or on the ColorQuick used in 4696 mode). Hardcopy output is formatted for a TEKTRONIX 4692, 4693D, 4695, 4696, or ColorQuick Color Copier. |
| 2 | Tektronix color copier at HC: (gives color dialog copies on the 4696 or on the ColorQuick used in 4696 mode). Hardcopy output is formatted for the same color copiers as supported by <i>copier-type 1</i> . |
| 3 | TEKTRONIX 4644 and Epson FX-80-compatible monochrome dot-matrix printers at HC: |
| 4 | Hewlett-Packard ThinkJet printer at HC: |
| 5 | Hewlett-Packard LaserJet+ printer at P0: |

- 6 Hewlett-Packard LaserJet+ printer at P1:
 - 7 Hewlett-Packard LaserJet+ printer at HC:
 - 8 DEC LA210 printer at P0:
 - 9 DEC LA210 printer at P1:
 - 10 DEC LA210 printer at HC:
 - 11 TEKTRONIX ColorQuick Copier with A-size media at HC:
 - 12 TEKTRONIX ColorQuick Copier with B-size media at HC:
 - 13 TEKTRONIX 4644 and Epson FX-80-compatible monochrome dot-matrix printers at P0:
 - 14 TEKTRONIX 4644 and Epson FX-80-compatible monochrome dot-matrix printers at P1:
 - 15 Alps ALQ324e, Epson LQ-2500-compatible, or other wide-carriage color dot-matrix printer at P0:
 - 16 Alps ALQ324e, Epson LQ-2500-compatible, or other wide-carriage color dot-matrix printer at P1:
 - 17 Alps ALQ324e, Epson LQ-2500-compatible, or other wide-carriage color dot-matrix printer at HC:
 - 18 DEC LN03 Plus printer at P0:
 - 19 DEC LN03 Plus printer at P1:
 - 20 DEC LN03 Plus printer at HC:
 - 21 Hewlett-Packard DeskJet printer at P0:
 - 22 Hewlett-Packard DeskJet printer at P1:
 - 23 Hewlett-Packard DeskJet printer at HC:
- Defaults: After FACTORY = 1
Omitted = 0

HCMAP MAP-INDEX-TO-PRINT

§11 Peripherals

Specifies how colors will be printed in monochrome copies (copies made on monochrome printers or on color copiers with HCFEATURES Feature 6 set to 4).

Syntax

Tek: **%cQI** int-array: *mono-map-values*
 Setup: **HCMAP** integer-array: *mono-map-values*
 STI: **LLINPT** (length, *mono-map-values*)

NOTE

In Setup mode, the integer array does not include a "count" describing how many integers follow in the array. It only includes the "couples" — groups of two integers, each group specifying a color index and print code.

Parameters

mono-map-values (length 2 to 32766, multiple of two)

Specifies which color indices print in monochrome screen copies. Specified as a series of doubles. The first element of the double designates the index to be mapped, and the second element specifies whether that index prints.

first element: *index-to-be-mapped*

Specifies a particular graphics color index.

–1 Specifies "all color indices"

0 to 255 Specifies a color index

second element: *monochrome-print-code*

Specifies whether the color index specified by *index-to-be-mapped* prints in monochrome copies.

0 Index does not print in monochrome copies

1 Index prints (as black) in monochrome copies

Defaults: After FACTORY = All indices print except
Index 0
Omitted = Error Q11

HCMONochrome**SET-HARDCOPY-MONochrome-ATTRIBUTES***§11 Peripherals*

Sets line termination characteristics for data sent to monochrome printers.

Syntax

Tek: E_cQE int-array: *monochrome-attributes*

Setup: **HCMONochrome** integer-array: *monochrome-attributes*

STI: **LLHCMA** (*length, monochrome-attributes*)

Parameters

monochrome-attributes (length 1)

Selects copy attributes for monochrome copiers.

first element: *line-termination* Specifies the line termination (C_R or C_R^LF) sent to monochrome copiers:

0 Send C_R at end of line

1 Send C_R^LF at end of line

Defaults: After FACTORY = 1
 Omitted = 0

HCORIENT**SET-IMAGE-ORIENTATION***§11 Peripherals*

Selects horizontal orientation or vertical orientation and position for screen copies.

Syntax

Tek: E_cQO int: *orientation*

Setup: **HCORIENT** keyword: *orientation*

STI: **LLHCOR** (*orientation*)

Parameters

orientation

Selects the image orientation of screen copies with respect to the hardcopy media. Valid range is 0 to 4.

- 0 Long axis of image on long axis of media (Setup: **HORIZONTAL**)
- 1 Long axis of image on short axis of media, at bottom (Setup: **VBOTTOM**)
- 2 Long axis of image on short axis of media, centered (Setup: **VCENTER**)
- 3 Long axis of image on short axis of media, at top (Setup: **VTOP**)
- 4 Use current printer settings (printers with TPI interface only — for other printers has the same effect as 0) (Setup: **PRINTER**)

Defaults: After FACTORY = 0
 Omitted = 0

HCREPAINT *SET-COLOR-COPIER-REPAINT*

§11 Peripherals

Specifies the number of times the copier overwrites the copy image (4692 only).

Syntax

Tek: \mathbb{E}_c QT int: *repaint-count*
 Setup: HCREPAINT integer: *repaint-count*
 STI: LLCCRP (*repaint-count*)

Parameters*repaint-count*

Specifies the number of times the image is overwritten on a 4692 copier. Valid range is 0 to 4 (a *repaint-count* of 0 is equivalent to 1).

Defaults: After FACTORY = 1
 Omitted = 1

HCRESERVE *RESERVE-COLOR-COPIER*

§11 Peripherals

Reserves a multiplexed copier.

Syntax

Tek: \mathbb{E}_c QR int: *reserve-code*
 Setup: HCRESERVE keyword: *reserve-code*
 STI: LLHCRE (*reserve-code*)

Parameters*reserve-code*

Specifies whether a multiplexed copier is to be reserved.

0 Unreserve — color copier is free to poll other connected devices (Setup: **NO**).

1 Reserve — color copier is restricted from polling other connected devices (Setup: **YES**).

Defaults: After FACTORY = 0
 Omitted = 1

HCSIZE *SET-COPY-SIZE*

§11 Peripherals

Selects one of two sizes for dialog copies.

Syntax

Tek: \mathbb{E}_c QA int: *size*
 Setup: HCSIZE integer: *size*
 STI: LLHCSZ (*size*)

Parameters*size*

Selects normal-size copies or small copies.

0 Selects the 80-column copy size

1 Selects the 132-column copy size

Defaults: After FACTORY = 0
 Omitted = 0

HCSTATISTICS *HARDCOPY-STATISTICS*

§11 Peripherals

Prints out total number of bytes required by the last background hardcopy command performed.

Syntax

Setup: HCSTATISTICS

Parameters

None

HELP HELP

§5 Programming Services

Generates a list of parameter types for all valid commands.

Syntax

Setup: **HELP** string: *command-name*, *command-cluster*,
or *escape-sequence*

Parameters

command-name

This is the Setup name of a command, or a special inquiry name for certain system settings. The Setup and special inquiry names may be entered in upper, lower, or mixed case characters, and may be abbreviated to as few characters as are necessary to make them unique.

The special inquiry names are:

VERSION
LEVEL
AMEMORYBLOCKS
BUFFERS
MEMORYBLOCKS
PMEMORYBLOCKS
SCREENSIZE

escape-sequence

This is the E_c character, followed by an opcode for a Tek command. The characters of the opcode must be typed in uppercase.

command-cluster

This is a *command-cluster*, which is functional grouping of commands. As with the *Setup-command-name*, the *command-cluster* may be entered in upper or lower or mixed case characters, and may be abbreviated. The cluster names are:

ANSI
COAX (coax option)
COMMUNICATIONS
DIALOG
GENERAL
GIN
GRAPHICS
HARDCOPY
KEYBOARD
PIXELS
2PPI
REPORT/INPUT
SEGMENTS
SURFACES
VIEWS

Defaults: After FACTORY = (none)
Omitted = complete list

HOSTPORT HOST-PORT

Selects the path used for communications between the host and the graphics system. Requires Coax option (Option CX).

Syntax

Setup: **HOSTPORT** keyword: *path*

Parameters

path

Specifies which path to use for host communications.

COAX Specifies the BNC coax connector port.

HO: Specifies the HO: logical device (see DMAP).

Defaults: After FACTORY = COAX
Omitted = HO:

HT HORIZONTAL-TAB*§14 Text*

Moves the active position to the next tab stop in the dialog area or one space in the graphics area.

Syntax

Tek: H_T

ANSI: H_T

VT52: H_T

Setup: None

STI: None

Parameters

None

HTS CHARACTER-TABULATION-SET*§15 Dialog Area*

Sets a tab stop at the active position.

Syntax

ANSI: HTS (88 hex) or
 H_T (1B,48 hex)

Setup: None

Parameters

None

HTSA HORIZONTAL-TAB-SET-ABSOLUTE*§15 Dialog Area*

Clears all tab stops in the active dialog area and resets them at specified positions.

Syntax

ANSI: H_c [Pn: *tab-positions* [; . . .] H_P N

Setup: See TABS

Parameters*tab-positions*

Specifies the columns in which tab stops are to be placed in the active dialog area:

0 Clears all horizontal tab stops

1 to 32767 Sets tab stops at specified columns

Defaults: After FACTORY = Tabs every 8 columns
(1, 9, 17, . . .)
Omitted or 0 = 0

HVP CHARACTER-AND-LINE-POSITION*§15 Dialog Area*

Moves the active position to a specified row and column.

Syntax

ANSI: H_c [Pn: *row-number* ;
Pn: *column-number* f

Setup: None

Parameters*row-number*

Specifies the row to which the active position is to be moved. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

column-number (0 to 32767)

Specifies the column to which the active position is to be moved. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

IBROADCAST

INTERNET-BROADCAST-MODE

§9 Host Communications

Selects the Internet Broadcast mode. Requires LAN option (Option 3H).

Syntax

Tek: See SET-NET-ADDRESSES

Setup: **IBROADCAST** keyword: *add-flag*
integer: *broadcast-address*

STI: See SET-NET-ADDRESSES

Parameters

add-flag

Specifies the broadcast mode is to be added to network tables.

ADD Add broadcast mode.

Defaults: After FACTORY = ADD
Omitted = ADD

broadcast-address

Specifies the Internet broadcast address.

0 Sets the Internet broadcast address to 00 00 00 00 hex.

1 Sets the Internet broadcast address to FF FF FF FF hex.

Defaults: After FACTORY = 1
Omitted = 1

ICH INSERT-CHARACTER

§15 Dialog Area

Inserts one or more blank characters at the active position in the active dialog area.

Syntax

ANSI: Pn : *number-of-characters* @

Setup: None

Parameters

number-of-characters

Specifies the number of characters to be inserted. Valid values are 0 to 32767.

0 to 32767 Specifies the number of characters

Defaults: After FACTORY = (none)
Omitted or 0 = 1

IDENTIFY IDENTIFY

§6 Reports

Causes the graphics system to identify itself to the host.

Syntax

VT52: PcZ

Parameters

None

IGATEADDRESS

INTERNET-GATEWAY-ADDRESS

§9 Host Communications

Specifies the Internet gateway address. Requires LAN option (Option 3H).

Syntax

Tek: See SET-NET-ADDRESSES

Setup: **IGATEADDRESS** keyword: *add-flag*
 string: *remote-network-number*
 string: *gateway-address*
 string: *net-mask*

STI: See SET-NET-ADDRESSES

Parameters

add-flag

Specifies whether the Internet gateway address is added or deleted.

DEL Delete the Internet gateway address.

ADD Add the Internet gateway address.

Defaults: After FACTORY = (none)
 Omitted = Error OX11

remote-network-number (length 0 to 15)

Specifies the remote network number in the form *xxx.xxx.xxx.xxx*, where *x* must be an ASCII character from 0 to 9 or may be omitted.

Defaults: After FACTORY = null
 Omitted = null

gateway-address (length 7 to 15)

Specifies the Internet address of the host that acts as a gateway to the remote network; expressed in the form *xxx.xxx.xxx.xxx*, or *xxx.xxx.xxx*, where *x* must be an ASCII character between 0 and 9 or may be omitted.

Defaults: After FACTORY = (none)
 Omitted = null

net-mask (length 15)

Specifies the mask used to determine the Network and Subnet portions of the Internet address. Expressed in the form *xxx.xxx.xxx.xxx*; valid range is between 255.000.000.000 and 255.255.255.255.

Defaults: After FACTORY = (none)
 Omitted = Default of netmask of network class being used.

IGNOREDEL IGNORE-DELETES

§4 Command Syntax

Specifies whether the Tek parser ignores P_T characters (7F hex).

Syntax

Tek: P_TKI int: *ignore-deletes-mode*

Setup: **IGNOREDEL** keyword: *ignore-deletes-mode*

STI: **LLIGDL** (*ignore-deletes-mode*)

Parameters

ignore-deletes-mode

Specifies whether P_T characters should be ignored or not.

0 Do not ignore P_T characters (Setup: **NO**).

1 Ignore P_T characters (Setup: **YES**).

Defaults: After FACTORY = 0
 Omitted = 1

IHOSTADDRESS

INTERNET-HOST-ADDRESS

§9 Host Communications

Specifies the Internet host address. Requires LAN option (Option 3H).

Syntax

Tek: See SET-NET-ADDRESSES

Setup: **IHOSTADDRESS** keyword: *add-flag*
string: *host-name*
string: *internet-address*

STI: See SET-NET-ADDRESSES

Parameters

add-flag

Specifies whether the host address is added or deleted.

DEL	Delete the host address from the host-Internet table.
-----	---

ADD Add the host address to the host-Internet table.

Defaults: After FACTORY = (none)
Omitted = Error OX11

host-name (length 2 to 32)

Specifies the host name. Valid characters are decimal point (.), hyphen (-), and underscore (_) and ASCII characters in the range a to z, A to Z, 0 to 9.

Defaults: After FACTORY = null
 Omitted = null

internet-address (length 7 to 15)

Specifies the Internet address. Expressed in the form xxx.xxx.xxx.xxx, where x must be an ASCII character from 0 to 9 or be nonexistent.

Defaults: After FACTORY = (none)
Omitted = null

IL *INSERT-LINE*

\$15 Dialog Area

Inserts one or more blank lines before the active line.

Syntax

ANSI: E_c Pn: *number-of-lines* L

Setup: None

Parameters

number-of-lines

Number of lines to be inserted. Valid values are 0 to 32767.

Defaults: After FACTORY = (none)
Omitted or 0 = 1

ILANADDRESS *INTERNET-LAN-ADDRESS**§9 Host Communications*

Specifies the Internet host LAN address. Requires LAN option (Option 3H).

Syntax

Tek: See SET-NET-ADDRESSES

Setup: **ILANADDRESS** keyword: *add-flag*
string: *internet-address*
string: *lan-address*

STI: See SET-NET-ADDRESSES

Parameters*add-flag*

Specifies whether the host LAN address is added to or deleted from the ARP Internet table (an Ethernet-to-Internet combination).

DEL Deletes the host LAN address.

ADD Add the host LAN address.

Defaults: After FACTORY = (none)
Omitted = Error OX11

internet-address (length 7 to 15)

Specifies the Internet address to be assigned to the local network address assigned with *lan-address*. It is expressed in the form *xxx.xxx.xxx.xxx*, where *x* must be an ASCII character from 0 to 9 or may be omitted.

Defaults: After FACTORY = null
Omitted = null

lan-address (length 11 to 17)

Specifies the local network address (for IEEE 802.3 and Ethernet networks the local network address consists of 6 two-digit hex numbers) expressed in the form *xx:xx:xx:xx:xx:xx*, where *x* must be an ASCII character from 0 to 9, A to F, a to f, or may be omitted.

Defaults: After FACTORY = (none)
Omitted = null

IND *INDEX**§15 Dialog Area*

Moves the active position down one line, without changing the column position.

Syntax

ANSI: **IND** (84 hex) or
 ^EcD (1B,44 hex)

Setup: None

Parameters

None

IRM *INSERT/REPLACE-MODE**§15 Dialog Area*

Specifies whether a newly entered character is inserted at the active position or replaces the character at the active position.

Syntax

ANSI: ^Ec[4I (Reset: Replace Mode)
 ^Ec[4h (Set: Insert Mode)

Setup: **INSERTREPLACE**
keyword: *mode*

Parameters*mode* (Setup only)

Selects Insert mode or Replace mode:

INSERT Sets insert/replace to insert

REPLACE Sets insert/replace to replace

Defaults: After FACTORY = REPLACE
Omitted = REPLACE

ITERMADDRESS

INTERNET-TERMINAL-ADDRESS

§9 Host Communications

Adds the graphics system name and Internet address to the net address table. Requires LAN option (Option 3H).

Syntax

Tek: See SET-NET-ADDRESSES

Setup: **ITERMADDRESS** keyword: *add-flag*
string: *graphics-system-name*
string: *internet-address*
string: *net-mask*

STI: See SET-NET-ADDRESSES

Parameters

add-flag

Specifies whether the graphics system internet address is added or deleted.

DEL Set the Internet address to 0 and disconnect the LAN.

ADD Add the Internet address.

Defaults: After FACTORY = (none)
Omitted = Error OX11

graphics-system-name (length 2 to 32)

Specifies the graphics system name. Valid characters are decimal point (.), hyphen (-), underscore (_), and ASCII characters in the range a to z, A to Z, and 0 to 9.

Defaults: After FACTORY = null
 Omitted = null

internet-address (length 7 to 15)

Specifies the Internet address. Expressed in the form `xxx.xxx.xxx.xxx`, where `x` must be an ASCII character in the range 0 to 9 or may be omitted.

Defaults: After FACTORY = (none)
Omitted = null

net-mask (length 15)

The actual netmask expressed as a char array of the form `xxx.xxx.xxx.xxx`, where `x` must be an ASCII character in the range 0 to 9. Valid range is from 255.000.000.000 to 255.255.255.255.

Defaults: After FACTORY = (none)
Omitted = Default netmask of network class being used.

KAM *KEYBOARD-ACTION-MODE*

\$10 Keyboards

Locks or unlocks the keyboard.

Syntax

ANSI: $E_c[2l$ (Reset: Keyboard unlocked)
 $E_c[2h$ (Set: Keyboard locked)

Setup: See LOCKKEYBOARD

Parameters

None

KBDCHARSET *See SKCS*

KEYEXCHAR

SET-KEY-EXECUTE-CHARACTER

\$7 Macros

Specifies the *key-execute-character* that will be used to delimit parts of a Tek macro to be executed locally.

Syntax

Tek: **E_CKY** int: *key-execute-character*

Setup: **KEYEXCHAR** char: *key-execute-character*

STI: LLKYEX (*key-execute-character*)

Parameters

key-execute-character

Specifies the ADE of the ASCII character that delimits the part of a macro definition to be executed locally — that is, at the graphics system. Must be in the range 0 through 127.

Defaults: After FACTORY = 16
Omitted = 0

KEYEXPAND *ENABLE-KEY-EXPANSION**§7 Macros*

Enables or disables key-macro expansion for Tek key macros.

Syntax

Tek: E_cKW int: *mode*
 Ansi: $\text{E}_c[<3\text{ I}$ (Reset: KEYEXPAND YES)
 $\text{E}_c[<3\text{ h}$ (Set: KEYEXPAND NO)
 Setup: **KEYEXPAND** keyword: *mode*
 STI: **LLENKE** (*mode*)

Parameters*mode*

Specifies whether key-macros can be expanded by a key-press.

0 disables key expansion (Setup: **NO**).
 1 enables key expansion (Setup: **YES**).
 Defaults: After FACTORY = 1
 Omitted = 1

KEYMODE *SET-KEY-MODE**§10 Keyboards*

Locks, unlocks, or sets the mode of the Tek key and Compose Character key.

Syntax

Tek: E_cKJ int-array: *key-list*
 Setup: **KEYMODE** integer-array: *key-list*
 STI: **LLKYLK** (*length, key-list*)

Parameters*key-list* (length 2 or 4)

Specifies keys and associated key actions as pairs. The first number of each pair is the *key-number*, the second number the *key-action*. Valid *key-numbers* are 1 and 2, with valid *key-actions* depending on the *key-number*.

KEY MODES			
Key	Key- Number	Key- Action	Action
Tek	1	0	Unlock, leaving the mode unchanged
		1	Lock, leaving the mode unchanged
		2	Select Tek mode (Tek light <i>on</i>) and unlock
		3	Select Tek mode (Tek light <i>on</i>) and lock
		4	Select VT200 mode (Tek light <i>off</i>) and unlock
Compose Character	2	5	Select VT200 mode (Tek light <i>off</i>) and lock
		0	Unlock
		1	Lock

Defaults: After FACTORY = <1,2,2,0>
 Omitted = Error KJ11

KEYPADMODE See TEKKPAM, TEKKPNM

KEYUSEMODE See TEKKBUM

LANGUAGETYPE

SELECT-LANGUAGE-TYPE

Selects character set and text capabilities.

Syntax

Tek: $E_c\#(0)$ Selects EUROPEAN
 $E_c\#(1)$ Selects JISKANJI
 $E_c\#(2)$ Selects UNIXKANJI
 $E_c\#(3)$ Selects DECKANJI

ANSI: Same as Tek.

Setup: **LANGUAGETYPE**
 keyword: *language-type*

STI: None

Parameters

language-type (Setup)

Specifies the language type for the currently enabled dialog area.

- 0 Selects European languages (Setup: **EUROPEAN**)
- 1 Selects Japanese using Kanji, JIS style (Setup: **JISKANJI**)
- 2 Selects Japanese using Kanji, UNIX style (Setup: **UNIXKANJI**)
- 3 Selects Japanese using Kanji, DEC style (Setup: **DECKANJI**)

Defaults: After FACTORY = 0 (EUROPEAN)
 Omitted = 0 (EUROPEAN)

LEARN LEARN

§7 Macros

Defines or deletes a volatile key macro.

Syntax

Setup: **LEARN**

Parameters

None

LF LINE-FEED

§14 Text

Causes the active position to move down one line in the dialog area or the graphics position to move down one line in the graphics area.

Syntax

Tek: L_F

ANSI: L_F

Setup: None

STI: None

Parameters

None

LFCR *LFCR**§14 Text*

Controls whether a L_F is executed as only a L_F or as a L_F and a C_R .

Syntax

Tek: E_cKF int: *LFCR-mode*
 Setup: **LFCR** keyword: *LFCR-mode*
 STI: **LLLFCR** (*LFCR-mode*)

Parameters*LFCR-mode*

Specifies how L_F characters are executed:

0 As L_F only (Setup: **NO**).
 1 As L_FC_R (Setup: **YES**).

Defaults: After FACTORY = 0
 Omitted = 1

LINESTYLE *SET-LINE-STYLE**§18 Graphics Primitives*

Selects one of nine different line styles (dash patterns) for subsequent vectors.

Syntax

Tek: E_cMV int: *line-style*
 Setup: **LINESTYLE** integer: *line-style*
 STI: **LLLNST** (*line-style*)

Parameters*line-style*

Specifies the line style for vectors drawn on the screen.

0 solid
 1 to 8 a non-solid dash pattern

Defaults: After FACTORY = 0
 Omitted = 0

LINEINDEX *SET-LINE-INDEX**§18 Graphics Primitives*

Specifies the color index with which subsequent lines, panel boundaries, markers, and facet edges will be drawn.

Syntax

Tek: E_cML int: *line-index*
 Setup: **LINEINDEX** integer: *line-index*
 STI: **LLLNIN** (*line-index*)

Parameters*line-index*

Specifies the color in which subsequent lines are drawn.

0 to 32767
 Specifies a color index or color range

Defaults: After FACTORY = 1
 Omitted = 0

LNМ *LINE-FEED/NEW-LINE-MODE**§14 Text*

Specifies whether a L_F is executed as a Line Feed (L_F) or as a New Line (L_F and a C_R).

Syntax

ANSI: $\text{E}_c[20 \text{ l}$ (Reset: Line Feed)
 $\text{E}_c[20 \text{ h}$ (Set: New Line)
 Setup: See LFCR

Parameters

None

LOAD LOAD

§8 File System

Causes the contents of the file from *source* to be interpreted as commands.

Syntax

Tek: $\text{\textcircled{R}}_{\text{c}}\text{JL}$ device: *source*
 Setup: LOAD string: *source*
 STI: LLLOAD (*length, source*)

Parameters

source

The source of the file to be executed as commands.
 Must be one of the following: HO:, P0:, P1:, Mx:ENV or Mx:DEF (where x = 0 to 9).

Defaults: After FACTORY = (none)
 Omitted = error JL11 (Level 2)

LOADADDRESSES LOAD-ADDRESSES

§9 Host Communications

Loads Internet network address information that was saved by SAVEADDRESSES. Requires LAN option (Option 3H).

Syntax

Tek: See SET-NET-ADDRESSES
 Setup: LOADADDRESSES
 STI: See SET-NET-ADDRESSES

Parameters

None

LOCAL LOCAL

§5 Programming Services

Places the graphics system into or out of Local mode.

Syntax

Setup: LOCAL keyword: *Local-mode*

Parameters

Local-mode

Turns Local mode on or off.

- 0 Removes the graphics system from Local mode (Setup: **NO**).
- 1 Places the graphics system in Local mode (Setup: **YES**).

Defaults: After FACTORY = 0
 Omitted = 0

LOCKKEYBOARD LOCK-KEYBOARD

§10 Keyboards

Locks or unlocks the keyboard keys, Mouse buttons, and Thumbwheel buttons.

Syntax

Tek: $\text{\textcircled{R}}_{\text{c}}\text{KL}$ int: *locking-mode*
 Setup: LOCKKEYBOARD keyword: *locking-mode*
 STI: LLKBLK (*locking-mode*)

Parameters

locking-mode

Specifies whether the keyboard is locked or unlocked.

- 0 Unlocks the keyboard (Setup: **NO**).
- 1 Locks the keyboard (Setup: **YES**).

Defaults: After FACTORY = 0
 Omitted = 1 (YES)

LOCKVIEWINGKEYS

LOCK-VIEWING-KEYS

§17 Viewing System

Enables or disables the Local Viewing keys.

Syntax

Tek: \mathbb{R}_c RJ int: *locking-mode*
Setup: LOCKVIEWINGKEYS keyword: *locking-mode*
STI: LLVKLK (*locking-mode*)

Parameters*locking-mode*

Specifies whether the viewing keys are locked or unlocked.

0 Unlocks the viewing keys. (Setup: **NO**).
1 Locks the viewing keys. (Setup: **YES**).

Defaults: After FACTORY = 0
 Omitted = 0

LS0 LOCKING-SHIFT-ZERO

§14 Text

Invokes the G0 character set into Graphics Left.

Syntax

Tek: s_1 (Standard syntax)
 $\mathbb{R}_c s_1$ (Alternate syntax)
ANSI: s_1
Setup: None
STI: LLAFNT (0)

Parameters

None

LS1 LOCKING-SHIFT-ONE

§14 Text

Invokes the G1 character set into Graphics Left.

Syntax

Tek: s_o (Standard syntax)
 $\mathbb{R}_c s_o$ (Alternate syntax)
ANSI: s_o
Setup: None
STI: LLAFNT (1)

Parameters

None

LS1R LOCKING-SHIFT-ONE-RIGHT

§14 Text

Invokes the G1 character set into Graphics Right.

Syntax

Tek: \mathbb{R}_c^-
ANSI: \mathbb{R}_c^-
Setup: None
STI: None

Parameters

None

LS2 *LOCKING-SHIFT-TWO*

§14 Text

Invokes the G2 character set into Graphics Left.

Syntax

TEK: None

ANSI: \mathbb{E}_{cn}

Setup: None

STI: None

Parameters

None

LS3 *LOCKING-SHIFT-THREE*

§14 Text

Invokes the G3 character set into Graphics Left.

Syntax

TEK: None

ANSI: \mathbb{E}_{co}

Setup: None

STI: None

Parameters

None

LS2R *LOCKING-SHIFT-TWO-RIGHT*

§14 Text

Invokes the G2 character set into Graphics Right.

Syntax

Tek: $\mathbb{E}_c\}$

ANSI: $\mathbb{E}_c\}$

Setup: None

STI: None

Parameters

None

LS3R *LOCKING-SHIFT-THREE-RIGHT*

§14 Text

Invokes the G3 character set into Graphics Right.

Syntax

Tek: $\mathbb{E}_c|$

ANSI: $\mathbb{E}_c|$

Setup: None

STI: None

Parameters

None

MACROSTATUS *MACROSTATUS**§7 Macros*

Displays the character string that defines a Tek macro.

Syntax

Setup: **MACROSTATUS** key-specifier: *macro-status*

Parameters*macro-number*

The number of the Tek macro whose definition is to be displayed.

-32768 to -32513 Displays a specific byte macro

-774 to -2 Displays a specific key macro

-1 Displays all Tek macros (Setup: **ALL**)

0 to 32767 Displays a specific macro

Defaults: After FACTORY = (none)
Omitted = 0

MARKER *DRAW-MARKER**§18 Graphics Primitives*

Draws a marker at a specified location.

Syntax

Tek: $\text{\textcircled{E}}_c\text{LH}$ *xy+:* *position* (first explicit form)
 $\text{\textcircled{F}}_s$ *xy+:* *position* (second explicit form)
xy+: *position* (implicit form)

Setup: **MARKER** *xy+:* *position*

STI: **LLMRKR** (*position* [x-value, y-value])
LLMRK4 (*position* [x-value, y-value])

Parameters*position*

Specifies (in modeling space coordinates) where you want the marker drawn. The range of valid values for *x* and *y* is in the range -2^{31} to $2^{31} - 1$.

Defaults: After FACTORY = (none)
Omitted = 0,0

MARKERTYPE *SET-MARKER-TYPE**§18 Graphics Primitives*

Specifies the marker type for subsequent markers.

Syntax

Tek: $\text{\textcircled{E}}_c\text{MM}$ int: *marker-number*

Setup: **MARKERTYPE**
integer: *marker-number*

STI: **LLMKTY** (*marker-type*)

Parameters*marker-number*

Specifies which marker type is used when the graphics system draws a marker.

0 to 10
Specifies a predefined marker type.

11 to 127
Specifies an application-defined marker type.

Defaults: After FACTORY = 0
Omitted = 0

MC *MEDIA-COPY**§11 Peripherals*

Transfers text data to a copier connected to the COPIER port, generating a dialog copy or enabling/disabling a printing mode.

Syntax

ANSI: $\text{\textcircled{E}}_c$ [*Ps:* *copy-option* . . .]

Setup: **AUTOPRINT** (Autoprint mode only)
CONTROLLERMODE (Printer Controller mode only)

Parameters

copy-option

Starts or stops transfer of data to a copier.

- | | |
|-----------|--|
| 0 | Copy Dialog area. (Setup: none). |
| 4 | Disable controller mode. (Setup: CONTROLLERMODE NO). |
| 5 | Enable controller mode. (Setup: CONTROLLERMODE YES). |
| ?1 | Copy active line. (Setup: none). |
| ?3 | Enable or disable data logging. (Setup: AUTOPRINT TOGGLE). |
| ?4 | Disable data logging. (Setup: AUTOPRINT NO). |
| ?5 | Enable data logging. (Setup: AUTOPRINT YES). |
| Defaults: | After FACTORY = 4; ?4
Omitted = 0 or NO |

MOVE MOVE

§18 Graphics Primitives

Moves the graphics position in 2-D modeling space.

Syntax

Tek:	$\mathbb{E}_c\text{LF}$ \mathbb{G}_s	$xy+:$ <i>position</i> (explicit form) $xy+:$ <i>position</i> (implicit form)
Setup:	MOVE	$xy+:$ <i>position</i>
STI:	LLMOVE LLMOV4	<i>(position [x,y])</i> <i>(position [x,y])</i>

Parameters

position

Specifies the new graphics position in modeling space. The range of valid values for x and y is in the range -2^{31} to $2^{31} - 1$.

Defaults: After FACTORY = (none)
Omitted = 0,0

MOUSEMAP MAP-MOUSE-TO-CURSOR-PAD

§20 Graphic Input

Allows the Mouse/Thumbwheels to be used as a keyboard GIN device.

Syntax

Setup: **MOUSEMAP** keyword: *mode*

Parameters

mode

Specifies whether the Cursor Pad or Mouse/Thumbwheels is mapped to Device 0.

NO (0) Device 0 is the Cursor Pad.
YES (1) Device 0 is the Mouse/Thumbwheels.

Defaults: After FACTORY = NO
Omitted = YES

MUXSETTINGS *SET-MULTIPLEXER*

§8 File System

Enables or disables multiplexing and demultiplexing.

Syntax

Tek: **%cNX** int-array: *all-device-strings*

Setup: **MUXSETTINGS**
 delim-string: *all-device-strings*

STI: **LLMUXS** (*length, all-device-strings*)

Parameters*all-device-strings*

(length 0 or 6 to 124),
 (elements 0 to 127)

Specifies zero to four device-strings. A device string is composed of four sub-strings: a device, a control-string, an ID-string, and an option-string. The device has three characters, and the other three sub-strings are each terminated with a `%u` character, so the minimum length of a device-string is 6 characters. The control-string and ID-string each have 0 to 10 characters, and the option-string has 0 to 5 characters, so the maximum length of a device-string is 31 characters. If the same device is included in more than one device-string, error NX11 (Level 2) is detected and the command is not executed. The valid bytes for the substrings are shown below, in this syntactic breakdown of the full parameter:

```
<all-device-strings> = <device-string> ...
<device-string> = <device><control-string>
                  %u<ID-string>%u
                  <option-string>%u
<device> = MX:, HO:, P0: or P1:
<control-string> = 0 to 10 non-%u bytes
<ID-string> = 0 to 10 non-%u bytes
<option-string> = 0 to 5 bytes from
                  {a,d,i,p,r,A,D,I,P,R}
```

Defaults: After FACTORY = empty array
 Omitted = empty array

NEL *NEXT-LINE*

§15 Dialog Area

Moves the active position to the beginning of the line following the active line.

Syntax

ANSI: **NEL** (85 hex) or
 %c E (1B,45 hex)

Setup: None

Parameters

None

NVDEFINE *DEFINE-NONVOLATILE-MACRO*

§7 Macros

Defines or deletes a nonvolatile Tek macro.

Syntax

Tek: **%cKO** key-specifier: *macro-number*
 int-array: *macro-contents*

Setup: **NVDEFINE** key-specifier: *macro-number*
 delim-string: *macro-contents*

STI: **LLDNVM** (*macro-number, length, macro-contents*)

Parameters*macro-number*

Specifies the nonvolatile macro to be defined or deleted:

-32768 to -32513 Byte macros

-861 to -2 Key macros

-1 All macros (deletes all volatile and nonvolatile macros).

0 to 143 Key macros

144 to 32767 Host macros

Any character (Setup) Key macros 0 to 127

F1 to F8 (Setup) Key macros 128 to 135

S1 to S8 (Setup) Key macros 136 to 143

Defaults: After FACTORY = (none)
 Omitted = 0

Command Summary

macro-contents (length 0 to $2^{28} - 1$)

This parameter specifies the characters (using their ASCII decimal equivalents in the range 0 through 255) that are to be issued when the macro is expanded. An array of length 0 deletes the nonvolatile macro for the specified macro number.

Defaults: After FACTORY = (none)
Omitted = empty array

NVLEARN *NONVOLATILE-LEARN*

§7 Macros

Defines or deletes a nonvolatile key macro.

Syntax

Setup: NVLEARN

Parameters

None

NVSAVE *SAVE-NONVOLATILE-PARAMETERS*

§3 System Initialization

Saves command settings and non-volatile macro definitions.

Syntax

Tek: $\text{\textcircled{R}}_c\text{KU}$

Setup: NVSAVE

STI: LLNVS

Parameters

None

ORIGINMODE *See TEKOM*

OSC *OPERATING-SYSTEM-COMMAND*

§4 Command Syntax

Initiates an operating system command control string.

Syntax

ANSI: OSC (9D hex) or
 $\text{\textcircled{R}}_c\text{I}$ (1B,5D hex)

Setup: None

Parameters

None

OVERWINDOW *SET-OVERVIEW-WINDOW*

§17 Viewing System

Sets the overview window for the current view.

Syntax

Tek: $\text{\textcircled{R}}_c\text{UW}$ *xy: first-corner*
xy: second-corner

Setup: OVERWINDOW *xy: first-corner*
xy: second-corner

STI: LLOVWI (*first corner [x,y], second corner [-x,y]*)

LLOVW4 (*first corner [x,y], second corner [-x,y]*)

Parameters

first-corner

Specifies the first corner of the overview window.

$x = -2^{31}$ to $2^{31}-1$, $y = -2^{31}$ to $2^{31}-1$

Defaults: After FACTORY = 0,0
Omitted = 0,0

second-corner

Specifies the second corner of the overview window.

$x = -2^{31}$ to $2^{31}-1$, $y = -2^{31}$ to $2^{31}-1$

Defaults: After FACTORY = 4095,4095
Omitted = 0,0

PACING *PACING**§9 Host Communications*

Determines whether, during coax communications, the graphics system sends a response to the host after each Tektronix graphics buffer. Requires Coax option (Option CX).

Syntax

Tek: (none)

Setup: **PACING** keyword: *pacing-mode*

Parameters*pacing-mode*

Specifies whether pacing mode is used.

- YES Specifies that graphics system to host pacing is to be done.
- NO Specifies that the host can send graphics in streaming mode.
- Defaults: After **FACTORY** = NO
 Omitted = NO

PAGE *PAGE**§17 Viewing System*

Renews the current view, and may do other actions depending on whether or not the dialog area is enabled.

Syntax

Tek: $E_C F_F$

Setup: None

STI: **LLPAGE**

Parameters

None

PANELFILL *SET-PANEL-FILLING-MODE**§18 Graphics Primitives*

This command selects display characteristics of the panel fill pattern.

Syntax

Tek: $E_C MS$ int: *overstrike/replace*
 int: *cover-boundary*
 int: *pattern-keying-mode*

Setup: **PANELFILL** keyword: *overstrike/replace*
 keyword: *cover-boundary*
 keyword: *pattern-keying-mode*

STI: **LLFPNL** (*overstrike/replace, cover-boundary, pattern-keying-mode*)

Parameters*overstrike/replace*

Specifies Overstrike or Replace mode.

- 0 Replace mode (Setup: **REPLACE**).
- 1 Overstrike mode (Setup: **OVERSTRIKE**).
- Defaults: After **FACTORY** = 0
 Omitted = 0

cover-boundary

Specifies whether the boundary of the panel is covered when the panel is filled.

- 0 Do not cover panel boundary (Setup: **NO**).
- 1 Cover panel boundary (Setup: **YES**).
- Defaults: After **FACTORY** = 0
 Omitted = 0

pattern-keying-mode

Specifies the position (direction) of the fill-pattern within the panel.

- 0 No change to keying (Setup: **NONE**).
- 1 Keyed to viewport position (Setup: **VIEWPORT**).
- 2 Keyed to lower left panel pixel (Setup: **PANEL**).
- 3 Keyed to absolute screen position (Setup: **SCREEN**).
- Defaults: After **FACTORY** = 1
 Omitted = 0

PARITY *SET-PARITY*

§9 Host Communications

Determines the parity and data-byte size for the HO: device.

Syntax

Tek: ^cNP int: *parity-mode*
Setup: **PARITY** keyword: *parity-mode*
STI: **LLPRTY** (*parity-mode*)

Parameters

parity-mode

Specifies the parity mode and the data-byte size.

- 0 Characters sent and received consist of seven data bits and one parity bit. The graphics system sets the parity bit to zero in characters it sends to the host (Setup: **7SPACE** or **NONE**).
- 1 Characters sent and received consist of seven data bits and one parity bit. The graphics system uses odd parity in characters it transmits to the host (Setup: **7ODD** or **ODD**).
- 2 Characters sent and received consist of seven data bits and one parity bit. The graphics system uses even parity in characters it transmits (Setup: **7EVEN** or **EVEN**).

- 3 Characters sent and received consist of seven data bits and one parity bit. The graphics system sets the parity bit to one in characters it transmits (Setup: **7MARK** or **HIGH**).
- 4 Characters sent and received consist of eight data bits and no parity bit. (Setup: **8NONE** or **DATA**).
- 5 Characters sent and received consist of eight data bits and one parity bit. The graphics system sets the parity bit to zero in characters it sends to the host (Setup: **8SPACE**).
- 6 Characters sent and received consist of eight data bits and one parity bit. The graphics system uses odd parity in characters it transmits to the host (Setup: **8ODD**).
- 7 Characters sent and received consist of eight data bits and one parity bit. The graphics system uses even parity in characters it transmits (Setup: **8EVEN**).
- 8 Characters sent and received consist of eight data bits and one parity bit. The graphics system sets the parity bit to one in characters it transmits (Setup: **8MARK**).
- 9 Character sent or received consists of seven data bits and no parity bit (Setup: **7NONE**).
- Defaults After FACTORY = 7SPACE
 Omitted = 7SPACE

PASSIGN *PORT-ASSIGN*

§11 Peripherals

Assigns a device protocol to a peripheral port.

Syntax

Tek: ^BcPA device: *port*
 string: *protocol-identifier*

Setup: **PASSIGN** string: *port*
 string: *protocol-identifier*

STI: **LLPASG** (*length, port, length, protocol-identifier*)

Parameters*port*

Specifies the peripheral port to which a protocol is being assigned.

P0: Peripheral Port 0.

P1: Peripheral Port 1.

Defaults: After FACTORY = (none)
 Omitted = Error PA11 (Level 2)

protocol-identifier

A string specifying the protocol being assigned to the peripheral port.

PPORT General-purpose RS-232-C protocol

4510 4510A Rasterizer protocol

4957 4957 tablet protocol

4957/S 4957 tablet stylus protocol

4958 4958 tablet protocol

4958/S 4958 tablet stylus protocol

4662 4662 plotter protocol

4662/MP 4662 multi-pen plotter protocol

4662/NT 4662 no-translation plotter protocol

4663 4663 plotter protocol

4663/NB 4663 no block mode protocol

4663/NT 4663 no-translation plotter protocol

HPGL Hewlett-Packard Graphics Language protocol

Defaults: After FACTORY = PPORT
 Omitted = Error PA21 (Level 2)

PBAUD *SET-PORT-BAUD-RATE*

§11 Peripherals

Sets the baud rate used at one of the peripheral ports.

Syntax

Tek: ^BcPR device: *port*
 int: *baud-rate*

Setup: **PBAUD** string: *port*
 integer: *baud-rate*

STI: **LLPBAU** (*length, port, baud-rate*)

Parameters*port*

Specifies the peripheral port to which a protocol is being assigned.

P0: peripheral Port 0.

P1: peripheral Port 1.

Defaults: After FACTORY = (none)
 Omitted = Error PR11 (Level 2)

baud-rate

The data rate (bits/second) used at the specified peripheral port. Valid rates are: 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, and 19200.

Defaults: After FACTORY = 2400 for all ports
 Omitted = Error PR21 (Level 2)

PBITS SET-PORT-STOP-BITS

§11 Peripherals

Sets the number of stop bits and data bits used in characters sent between the graphics system and its peripheral ports.

Syntax

Tek: \mathbb{E}_c PB device: *port*
 int: *number-of-stop-bits*
 int: *number-of-data-bits*

Setup: PBITS string: *port*
 integer: *number-of-stop-bits*
 integer: *number-of-data-bits*

STI: LLPBIT (*length, port, number-of-stop-bits,*
 number-of-data-bits)

Parameters

port

Specifies the peripheral port for which data bits and stop bits are being assigned.

P0: Peripheral Port 0.

P1: Peripheral Port 1.

Defaults: After FACTORY = (none)
 Omitted = Error PB11 (Level 2)

number-of-stop-bits

Specifies the number of stop bits in each byte of data for the specified peripheral port. Valid entries are 1 and 2.

Defaults: After FACTORY = 1
 Omitted = Error PB21 (Level 2)

number-of-data-bits

Specifies the number of data bits in each byte of data for the specified peripheral port. This count does not include the parity bit, whose presence or absence is determined by the PPARITY command. Valid entries are 5, 6, 7, or 8.

Defaults: After FACTORY = 7
 Omitted = Error PB31 (Level 2)

PCOPIES SET-PORT-NUMBER-OF-COPIES

§11 Peripherals

Specifies the number of copies produced on the copier attached to the 4510A Rasterizer.

Syntax

Tek: \mathbb{E}_c PN string: *port-identifier*
 int: *number-of-copies*

Setup: PCOPIES string: *port-identifier*
 integer: *number-of-copies*

STI: LLPNCP (*length, port-identifier, number-of-copies*)

Parameters

port-identifier

Specifies the RS-232-C peripheral port on which the number of copies is being assigned. Valid values are P0: and P1:.

Defaults: After FACTORY = (none)
 Omitted = Error PN11

number-of-copies

The number of copies that are produced by the rasterizer. Valid values are 0 through 32767.

Defaults: After FACTORY = 1
 Omitted = 1

PCOPY *PORT-COPY**§8 File System*

This command establishes a data path between two devices so that a two-way data transfer can take place.

Syntax

Tek: ^cPC device: *source*
 string: *separator*
 device: *destination*

Setup: PCOPY string: *source*
 string: *separator*
 string: *destination*

STI: LLPCPY (*length, source, length, separator, length, destination*)

Parameters*source*

Specifies the first of two logical devices between which data flows. Must be one of the following: HO:, P0:, or P1:.

Defaults: After FACTORY = (none)
 Omitted = Error PC11 (Level 2)

separator

Must be the empty string or **TO**.

Defaults: After FACTORY = (none)
 Omitted = Empty string

destination

Specifies the second logical device for the data transfer. Must be one of the following: HO:, P0:, or P1:.

Defaults: After FACTORY = (none)
 Omitted = Error PC31

PDRAW *POLYDRAW**§18 Graphics Primitives*

Draws one or more vectors with a single command.

Syntax

Tek: ^cLD int: *move-draw-flag*
 xy+ array: *positions*

Setup: PDRAW integer: *move-draw-flag*
 xy+-array: *positions*

STI: LLPDRW (*move-draw-flag, length, positions*)
 LLPDR4 (*move-draw-flag, length, positions*)

Parameters*move-draw-flag*

Specifies *move* or *draw* for first *position*.

- | | |
|---|---|
| 0 | The graphics position is moved to the first <i>position</i> without drawing a vector. |
| 1 | A vector is drawn from the current graphics position to the first position. |

Defaults: After FACTORY = (none)
 Omitted = 0

positions (lengths in the range:)

0 to 8192 (Coordinate modes 0 and 1)

Specifies the end-points in modeling space of the vectors to be drawn. The range of valid values for *x* and *y* is in the range -2^{31} to $2^{31} - 1$.

Defaults: After FACTORY = (none)
 Omitted = empty array

PEOF SET-PORT-EOF-STRING

§11 Peripherals

Sets the port-end-of-file string for the specified peripheral port.

Syntax

Tek: $\%cPE$ device: *port*
 int-array: *PEOF-string*

Setup: PEOF string: *port*
 delim-string: *PEOF-string*

STI: LLPEOF (*length, port, length, EOF-string*)

Parameters

port

Names the peripheral port for which an end-of-file string is being specified.

P0: peripheral Port 0.
 P1: peripheral Port 1.
 Defaults: After FACTORY= (none)
 Omitted = Error PE11 (Level 2)

PEOF-string (length 1 through 10)

An array of ASCII characters that define the port EOF string. C0 controls can be entered in Setup using the Control key. Valid range is 0 through 255.

Defaults: After FACTORY = empty array
 Omitted = empty array

PFLAG SET-PORT-FLAGGING-MODE

§11 Peripherals

Sets the flagging mode for the specified peripheral port.

Syntax

Tek: $\%cPF$ device: *port*
 int: *flagging-mode*
 int: *go-character*
 int: *stop-character*

Setup: PFLAG string: *port*
 keyword: *flagging-mode*
 char: *go-character*
 char: *stop-character*

STI: LLPFLG (*length, port, flagging-mode, go-character, stop-character*)

Parameters

port

Names the peripheral port for which a flagging mode is being specified.

P0: Peripheral Port 0.
 P1: Peripheral Port 1.
 Defaults: After FACTORY = (none)
 Omitted = Error PF11

flagging-mode

Specifies the type of flagging the graphics system uses for the specified serial port.

0 No flagging (Setup: **NONE**).
 1 Character flagging (Setup: **CHAR**).
 2 Flagging with DTR, CTS signal lines (Setup: **DTR/CTS**).
 Defaults: After FACTORY = 0
 Omitted = 0

go-character

Specifies the start character used during character flagging (*flagging-mode 1* or *CHAR* in Setup).

0 to 255 Specifies the ADE of the start character.
 Defaults: After FACTORY = 17 (α_1)
 Omitted = 17 (α_1)

stop-character

Specifies the stop character used during character flagging (*flagging-mode 1* or *CHAR* in Setup).

0 to 255 Specifies the ADE of the stop character. If not 0, must be different from the *go-character*.

Defaults: After FACTORY = 19 (0₃)
Omitted = 19 (0₃)

PINVERSION*SET-PORT-BLACK-WHITE-INVERSION**§11 Peripherals*

Instructs the 4510A Rasterizer connected to a specific peripheral port to reverse black and white when processing hardcopies.

Syntax

Tek: $\text{\textcircled{E}}\text{cPJ}$ string: *port-identifier*
int: *image-polarity*

Setup: PINVERSION
string: *port-identifier*
keyword: *image-polarity*

STI: LLPBWI (*length, port-identifier, image-polarity*)

Parameters*port-identifier*

Specifies the RS-232 peripheral port on which the image polarity is being assigned. Valid values are P0: and P1:.

Defaults: After FACTORY = (none)
Omitted = Error PJ11

image-polarity

Specifies whether blacks and whites are copied in true representation or reversed when processed by the 4510A Rasterizer:

0 Black-white reversed image (Setup: **NEGATIVE**)

1 True black-white representation image (Setup: **POSITIVE**)

Defaults: After FACTORY = 0
Omitted = 0

PLAY *PLAY**§5 Programming Services*

Plays back the transactions that have been recorded by the DFT mode debugger, sending the data buffer to the device specified by DBPORT. Requires Coax option (Option CX).

Syntax

Setup: PLAY

Parameters

None

PLOT *PLOT**§8 File System*

Sends all visible segments from the current view to the host port or to a PPI port.

Syntax

Tek: $\text{\textcircled{E}}\text{cPL}$ string: *separator*
device: *destination*

Setup: PLOT
string: *separator*
string: *destination*

STI: LLPLOT (*length, separator, length, destination*)

Parameters*separator*

Separates the *source* and *destination* parameters. May be either the string *TO* (in uppercase or lowercase) or an empty string. May be omitted in Setup syntax.

Defaults: After FACTORY = (none)
Omitted = *TO* (empty string)

destination

Specifies where the data is to be sent. Must be one of the following: HO:, P0:, or P1:

Defaults: After FACTORY = (none)
Omitted = Error PL21 (Level 2)

PM PRIVACY-MESSAGE

§4 Command Syntax

Opening delimiter of a control string for privacy message use.

Syntax

ANSI: PM (9E hex) or
 ^c (1B,5E hex)

Setup: None

Parameters

None

PMAP MAP-INDEX-TO-PEN

§11 Peripherals

Assigns a color index to a plotter pen.

Syntax

Tek: ^cPI string: *port-identifier*
 int: *index-to-be-mapped*
 int: *pen-ID-number*

Setup: PMAP string: *port-identifier*
 integer: *index*
 integer: *pen-ID-number*

STI: LLINPN (*length, port-identifier, index, pen-ID-number*)

Parameters

port-identifier Specifies the peripheral port for which color-indices are to be mapped to plotter pen numbers. Valid values are P0: and P1:.

Defaults: After FACTORY = (none)
 Omitted = Error PI11

index-to-be-mapped

Specifies a particular color index. Valid values are -1 through 255 (-1 means "all color indices").

Defaults: After FACTORY = -1 (All)
 Omitted = 0

pen-id-number

Specifies a particular plotter pen. Valid values are 0 through *n* where *n* is the number of pens available on the particular plotter (Pen 0 means "no pen").

Defaults: After FACTORY = 1
 Omitted = 0

PMARKER POLYMARKER

§18 Graphics Primitives

Draws one or more markers with a single command.

Syntax

Tek: ^cLR xy+ array: *positions*

Setup: PMARKER xy+-array: *positions*

STI: LLPMRK (*length, positions*)
 LLPMR4 (*length, positions*)

Parameters

positions

(length 0 to 8192, Coordinate modes 0/1)

Specifies the positions in modeling space where the markers are to be drawn. The range of valid values for *x* and *y* is -2^{31} to $2^{31} - 1$.

Defaults: After FACTORY = (empty array)
 Omitted = 0,0

PORIENT *SET-PORT-IMAGE-ORIENTATION**§11 Peripherals*

Specifies how the 4510A Rasterizer orients the image on a copy.

Syntax

Tek: \mathbb{E}_c PO string: *port-identifier*
 int: *orientation*

Setup: **PORIENT** string: *port-identifier*
 keyword: *orientation*

STI: **LLPIOR** (*length, port-identifier, orientation*)

Parameters*port-identifier*

Specifies the RS-232 peripheral port on which the number of copies is being assigned. Valid values are P0: and P1:.

Defaults: After FACTORY = (none)
 Omitted = PO11

orientation

The orientation of the image to be copied:

- | | |
|---|---|
| 0 | Long axis of image on long axis of media (Setup: HORIZONTAL) |
| 1 | Long axis of image on short axis of media, at bottom (Setup: VBOTTOM) |
| 2 | Long axis of image on short axis of media, centered (Setup: VCENTER) |
| 3 | Long axis of image on short axis of media, at top (Setup: VTOP) |
- Defaults: After FACTORY = 0
 Omitted = 0

PPARITY *SET-PORT-PARITY**§11 Peripherals*

Selects the parity scheme to be used at the specified peripheral port.

Syntax

Tek: \mathbb{E}_c PP device: *port*
 int: *parity-mode*

Setup: **PPARITY** string: *port*
 keyword: *parity-mode*

STI: **LLPPRY** (*length, port, parity-mode*)

Parameters*port*

Names the peripheral port whose parity mode is being specified.

Valid ports are P0: and P1:.

Defaults: After FACTORY = (none)
 Omitted = error PP11

parity-mode

Specifies the parity mode for data sent through the specified peripheral port. The serial port can be selected to be in 5, 6, 7 or 8 bit data mode (see the PBITS command for more information). All parity modes transmit the number of bit data bits plus one parity bit except for NONE which transmits the number of data bits without a parity bit.

- | | |
|---|---|
| 0 | The transmitted parity bit is set to zero (Setup: SPACE or LOW) |
| 1 | Odd parity is transmitted (Setup: ODD). |
| 2 | Even parity is transmitted (Setup: EVEN). |
| 3 | The parity bit is set to one when transmitted (Setup: MARK or HIGH). |
| 4 | The parity bit is not transmitted (Setup: NONE). |

Defaults: After FACTORY = 0
 Omitted = 0

PQUEUE SET-PORT-QUEUE-SIZE

§11 Peripherals

This command selects the number of bytes the 4510A Rasterizer connected to the specified port will set aside for the communications input queue storage area.

Syntax

Tek: $\%cPS$ string: *port-name*
 int: *queue-size*

Setup: **PQUEUE** string: *port-name*
 integer: *queue-size*

STI: **LLPQSZ** (*length, port-name, queue-size*)

Parameters

port-name

Names the peripheral port for which a queue size is being assigned. Valid values are P0: or P1:.

Defaults: After FACTORY = (none)
 Omitted = Error PS11

queue-size

Number of bytes reserved for the 4510A rasterizer's communications input queue. Valid values are in the range 0 to $2^{31} - 1$. (The 4510A will not lower the queue below 1000.)

Defaults: After FACTORY = 1000
 Omitted = 0

PREPAINT

SET-PORT-COLOR-COPIER-REPAINT

§11 Peripherals

Specifies for a peripheral port the number of print passes to be made in each copy made by a 4692 Color Copier via a 4510A Color Graphic Rasterizer.

Syntax

Tek: $\%cPT$ string: *port*
 int: *repaint-count*

Setup: **PREPAINT** string: *port*
 integer: *repaint-count*

STI: **LLPCCR** (*length, port, repaint-count*)

Parameters

port

Specifies the RS-232-C peripheral port to which the repaint count is to be assigned. Valid values are P0: and P1:.

Defaults: After FACTORY = (none)
 Omitted = Error PT11

repaint-count

Specifies the number of times the image is transferred to the printer. Valid values are 0 through 4; 0 has the same effect as 1.

Defaults: After FACTORY = 1
 Omitted = Error 0

PROMPTMODE *PROMPT-MODE**§9 Host Communications*

Enables or disables Prompt mode.

Syntax

Tek: $\text{E}_{\text{c}}\text{NM}$ int: *prompt-mode*
 Setup: **PROMPTMODE** keyword: *prompt-mode*
 STI: **LLAPRM** (*prompt-mode*)

Parameters*prompt-mode*

Turns Prompt mode on and off, and specifies when Prompt mode should be turned on.

- 0 Turn Prompt mode off (Setup: **NO**).
- 1 Turn Prompt mode on after the next EOM character or *EOM-indicator* (Setup: **YES**).
- 2 Turn Prompt mode on immediately.
- Defaults: After FACTORY = 0 Omitted = 0

PROMPTSTRING *SET-PROMPT-STRING**§9 Host Communications*

Specifies the prompt string for the host.

Syntax

Tek: $\text{E}_{\text{c}}\text{NS}$ int-array: *prompt-string*
 Setup: **PROMPTSTRING**
 delim-string: *prompt-string*
 STI: **LLSPRM** (*length, prompt-string*)

Parameters*prompt-string* (length 0 to 10)

Specifies the prompt string. Valid values are 0 to 127

- Defaults: After FACTORY = ?_SP (ADE 63, ADE 32)
- Omitted = empty array

PXBEGIN *BEGIN-PIXEL-OPERATIONS**§16 Pixel Operations*

Sets the surface number, ALU mode, and bits-per-pixel for pixel operations.

Syntax

Tek: $\text{E}_{\text{c}}\text{RU}$ int: *surface-number*
 int: *ALU-mode*
 int: *bits-per-pixel*
 Setup: **PXBEGIN** integer: *surface-number*
 integer: *ALU-mode*
 integer: *bits-per-pixel*
 STI: **LLBPXL** (*surface-number, ALU-mode, bits-per-pixel*)

Parameters*surface-number*

Specifies the surface(s) on which subsequent pixel operations will take place.

- 1 Super surface
- 0 no change
- 1 to 8 the surface with the specified number.
- Defaults: After FACTORY = 1
- Omitted = unchanged

ALU-mode (0, 7, 11, 12, 15)

Arithmetic logic unit writing mode. The function that determines how the current pixel values (colors) interact with values introduced by subsequent pixel operations. A value of 0 means no change.

- Defaults: After FACTORY = 11
- Omitted = unchanged

bits-per-pixel

The number of bits that describes each pixel. Used by subsequent PXRASTERWRITE, PXRUNLENGTHWRITE, and SAVE commands.

- 0 no change
- 1 to 8 bits-per-pixel
- Defaults: After FACTORY = 6
- Omitted = unchanged

PXCOPY PIXEL-COPY

§16 Pixel Operations

Copies pixels from one rectangular area of the screen to another.

Syntax

Tek: \mathbb{R}_cRX int: *destination-surface*
 xy: *destination-lower-left-corner*
 xy: *first-source-corner*
 xy: *second-source-corner*

Setup: PXCOPY integer: *destination-surface*
 xy: *destination-lower-left-corner*
 xy: *first-source-corner*
 xy: *second-source-corner*

STI: LLPXCP (*destination-surface, destination-lower-left-corner [x,y], first-source-corner [x,y], second-source-corner [x,y]*)

Parameters

destination-surface

Specifies the surface to which pixels are to be copied.

- 1 super surface: all bit planes on all defined surfaces
- 0 the current pixel surface as defined by the last PXBEGIN command.
- 1 to 8 the surface with the specified number.

Defaults: After FACTORY = (none)
 Omitted = 0

destination-lower-left-corner

Specifies the lower left corner of the destination's rectangular region that the pixels will be copied to. The minimum valid x and y is 0. The maximum valid values are x = 1023, y = 767.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

first-source-corner

Specifies the first source corner of the rectangular region on the current pixel surface (typically, the lower left corner). The pixel at this corner is copied to the lower left corner of the destination region. The valid values are the same as for *destination-lower-left-corner*.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

second-source-corner

Specifies the corner diagonal from the first source corner (typically, the upper right corner). The valid values are the same as for *destination-lower-left-corner*.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

PXPOSITION SET-PIXEL-BEAM-POSITION

§16 Pixel Operations

Sets the pixel beam position.

Syntax

Tek: \mathbb{R}_cRH xy: *beam-position*

Setup: PXPOSITION xy: *beam-position*

STI: LLPXBM (*beam-position [x,y]*)

Parameters

beam-position

Position, relative to the pixel viewport's lower left corner, where the next PXRASTERWRITE, PXRUNLENGTHWRITE, or SAVE command will take effect. The minimum valid x and y is 0. The maximum valid values are x = 1023, y = 767.

Defaults: After FACTORY = x = 0, y = maximum valid value
 Omitted = 0, 0

PXRASTERWRITE RASTER-WRITE

§16 Pixel Operations

Writes to pixels in the pixel viewport or to pixels in a fill pattern definition.

Syntax

Tek: \mathbb{R}_cRP int: *number-of-pixels*
 char-array: *indices-array*

Setup: PXRASTERWRITE integer: *number-of-pixels*
 delim-string: *indices-array*

STI: LLRASW (*number-of-pixels, length, indices-array*)

Parameters

number-of-pixels (0 to 65535)

Specifies the number of pixels represented in the following char-array.

Defaults: After FACTORY = (none)
 Omitted = error RP11

indices-array (length 0 to 65535)

Specifies the color indices of individual pixels. Each ASCII character must be in the range 32 to 96.

Defaults: After FACTORY = (none)
 Omitted = (empty array)

PXRECTANGLE *RECTANGLE-FILL**§16 Pixel Operations*

Draws a filled rectangle on the current pixel surface using the current pixel ALU mode.

Syntax

Tek: RcRR *xy: first-corner*
 xy: second-corner
 int: fill-index

Setup: **PXRECTANGLE**
 xy: first-corner
 xy: second-corner
 integer: fill-index

STI: **LLRCFL** (*first-corner [x,y], second-corner [x,y],*
 fill-index)

Parameters*first-corner*

Specifies one corner of a rectangle, in pixel space coordinates. The minimum valid x and y is 0. The maximum valid values are x = 1023, y = 767.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

second-corner

Specifies the opposite corner of that rectangle. The valid values are the same as for *first-corner*.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

fill-index (0 to $2^{16}-1$)

The color index with which the rectangle is to be filled.

Defaults: After FACTORY = (none)
 Omitted = 0

PXRESTORE*RESTORE-PIXELS-FROM-MEMORY**§16 Pixel Operations*

Restores pixels to the screen from system memory.

Syntax

Tek: RcUK *int: ID-number*
 int: restore-flag
 xy: lower-left

Setup: **PXRESTORE** *integer: ID-number*
 integer: restore-flag
 xy: lower-left

STI: **LLRPFM** (*ID-number, restore-flag, lower-left*
 [x,y])

Parameters*ID-number (-1 and 1 to 32767)*

Specifies the graphics system memory area to be restored.

-1 Release all memory buffers used to save pixels

1 to 32767 A specific memory buffer

Defaults: After FACTORY = (none)
 Omitted = error UK11

restore-flag (0 to 3)

The two low bits of this integer parameter are two separate flag bits: Bit 0 controls memory release and bit 1 controls use of the *lower-left* parameter.

0 Release memory; use original position

1 Retain memory; use original position

2 Release memory; use position specified by *lower-left*

3 Retain memory; use position specified by *lower-left*

Defaults: After FACTORY = 0
 Omitted = 0

lower-left (0, 0 to 4095, 4095)

Specifies the pixel position at which the pixels are to be restored.

Defaults: After FACTORY = 0, 0
 Omitted = 0, 0

PXRUNLENGTHWRITE

RUNLENGTH-WRITE

§16 Pixel Operations

Writes to pixels in the pixel viewport or to pixels in a fill pattern definition.

Syntax

Tek: $\text{\textasciix{27}}\text{\textasciix{9}}\text{\textasciix{C}}\text{\textasciix{R}}\text{\textasciix{L}}$ int-array: *indices-array*

Setup: PXRUNLENGTHWRITE
 integer-array: *indices-array*

STI: LLRUNW (*length, indices-array*)

 LLRUN4 (*length, indices-array*)

Parameters

indices-array (0 to 65535)

Specifies the length of a run of pixels and the color of those pixels. The elements of the array must be in the range of 0 to $2^{31} - 1$.

PXSAVE SAVE-PIXELS-TO-MEMORY

§16 Pixel Operations

Saves a rectangular pixel area to a numbered buffer.

Syntax

Tek: $\text{\textasciix{27}}\text{\textasciix{9}}\text{\textasciix{C}}\text{\textasciix{U}}\text{\textasciix{J}}$ int: *id-number*
 xy: *first-corner*
 xy: *second-corner*

Setup: PXSAVE integer: *id-number*
 xy: *first-corner*
 xy: *second-corner*

STI: LLCPTM (*id-number, first-corner [x,y], second-corner [x,y]*)

Parameters

id-number (1 to 32767)

An identifying number for the main memory area used.

Defaults: After FACTORY = (none)
 Omitted = (none)

first-corner

Specifies one corner of the region to be saved, in pixel space coordinates. The minimum valid x and y is 0. The maximum valid values are x = 1023, y = 767.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

second-corner

Specifies the opposite corner of the region to be saved. Valid values are the same as for *first-corner*.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

PXVIEWPORT SET-PIXEL-VIEWPORT*§16 Pixel Operations*

Defines a rectangular pixel viewport.

Syntax

Tek: [®]cRS xy: *first-corner*
 xy: *second-corner*

Setup: PXVIEWPORT
 xy: *first-corner*
 xy: *second-corner*

STI: LLPXVW (*first-corner* [x,y], *second-corner* [x,y])

Parameters*first-corner*

Specifies one corner of the pixel viewport, in pixel space coordinates. The minimum valid x and y is 0. The maximum valid values are x = 1023, y = 767.

Defaults: After FACTORY = 0, 0
 Omitted = 0, 0

second-corner

Specifies the opposite corner of the pixel viewport, with the same valid values as *first-corner*.

Defaults: After FACTORY = maximum valid values
 Omitted = 0, 0

PXZOOM PIXEL-ZOOM*§16 Pixel Operations*

Copies pixels from one rectangular area of the screen to another while replicating pixels to provide a zoom function.

Syntax

Tek: [®]cUM int: *destination-surface*
 xy: *destination-lower-left-corner*
 xy: *first-source-corner*
 xy: *second-source-corner*
 int-array: *replication-factors*

Setup: FBPXZOOM *destination-surface*
 destination-lower-left-corner
 first-source-corner
 second-source-corner
 replication-factors

STI: LLPXZM (*destination-surface*, *destination-lower-left-corner* [x,y], *first-source-corner* [x,y], *second-source-corner* [x,y], *length*, *replication-factors*)

Parameters*destination-surface*

Specifies the surface to which pixels are to be copied.

-1 Super surface: all bit planes on all defined surfaces

0 The current surface as defined by the last PXBEGIN command.

1 to 8 A specific surface.

Defaults: After FACTORY = (none)
 Omitted = 0

destination-lower-left-corner

Specifies the lower left corner of the destination region. The minimum valid x and y is 0. The maximum valid values are x = 1023, y = 767.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

first-source-corner

Specifies one corner of the source region. Valid values are the same as for *destination-lower-left-corner*.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

second-source-corner

Specifies the other corner of the source region. Valid values are the same as for *destination-lower-left-corner*.

Defaults: After FACTORY = (none)
 Omitted = 0, 0

replication-factors (length 0 to 2)

Specifies the number of times each pixel from the source region is replicated as it is written to the destination region. The first element specifies the x replication factor and the second element specifies the y replication factor. The minimum valid value for both is 1, and the maximum valid value is SCREENSIZE, which is one greater than the maximum valid values for the corners, above.

Defaults: After FACTORY = (none)
 Omitted = 1, 1

QUEUE SIZE SET-QUEUE-SIZE

§9 Host Communications

Reserves internal memory for use by the host port (logical device HO:).

Syntax

Tek: RcNQ int: *queue-size*
 Setup: QUEUE SIZE integer: *queue-size*
 STI: LLQSIZ (*queue-size*)

Parameters

queue-size

Number of memory bytes reserved for the host port's input queue. Valid range is 1 through 65535.

Defaults: After FACTORY = 300
 Omitted = Error NQ11 (Level 2)

RECTANGLE DRAW-RECTANGLE

§18 Graphics Primitives

Draws rectangular panels in 2-D modeling space.

Syntax

Tek: RcUR xy-array: *opposite-corners*
 Setup: RECTANGLE
 xy-array: *opposite-corners*
 STI: LLRECT (*length, opposite-corners*)
 LLREC4 (*length, opposite-corners*)

Parameters

opposite-corners (even lengths in the range:)
 0 to 16384 (Coordinate mode 0)
 0 to 8192 (Coordinate mode 1)

An *xy-array* containing pairs of xy coordinates. Each pair of xys represents opposite corners of a rectangle to be drawn. The range of valid values for *x* and *y* is in the range -2^{31} to $2^{31}-1$.

Defaults: After FACTORY = (none)
 Omitted = 0 (empty array)

RENEW RENEW-VIEW

§17 Viewing System

Renews the specified view and all the views in its view display cluster, or renews all views if *view-number* is -1.

Syntax

Tek: RcKN int: *view-number*
 Setup: RENEW integer: *view-number*
 STI: LLRNVW (*view-number*)

Parameters

view-number (-1 to 64)

Specifies the view to be renewed.

-1 all views
 0 the current view
 1 to 64 a specific view

Defaults: After FACTORY = (none)
 Omitted = 0

REOM SET-REPORT-EOM-FREQUENCY

§6 Reports

Controls how frequently the graphics system intersperses *EOM-indicators* among the characters that comprise a report message.

Syntax

Tek: RcIM int: *EOM-frequency*
 Setup: REOM keyword: *EOM-frequency*
 STI: LLEOMF (*EOM-frequency*)

Parameters

EOM-frequency (0 or 1)

Specifies whether *EOM-indicators* should be sent more or less frequently in reports to the host. "More frequently" means at the end of each part of the message; "less frequently" means only when needed to prevent the maximum line length from being exceeded.

0 less frequently (Setup: **NO**)
 1 more frequently (Setup: **YES**)

Defaults: After FACTORY = 1
 Omitted = 1

REPORT-4010-STATUS

REPORT-4010-STATUS

§6 Reports

Causes the graphics system to send a 4010-Status-Report to the host.

Syntax

Tek: $E_c E_q$

STI: LLST10 (*returned-x, returned-y, returned-status*)

Parameters

None

Description

This command causes the graphics system to send a 4010-Status-Report to the host. If 4010-GIN was enabled, it is disabled and Alpha mode is entered.

The 4010-Status-Report Format

The 4010-Status-Report is sent in response to a REPORT-4010-STATUS command. The report has two forms, depending on whether 4010 GIN is enabled when the REPORT-4010-STATUS command is sent.

4010-Status-Report = 4010-GIN-Status-Report
or
4010-Non-GIN-Status-Report

4010-GIN-Status-Report =
point-report
EOM-indicator

4010-Non-GIN-Status-Report =
4010-status-byte
point-report
EOM-indicator

4010-status-byte = a seven-bit ASCII character whose high-order two bits are "01" and whose least-significant five bits hold status information, described below.

point-report = *xy+ report*
or
10-bit-xy report

4010-status-byte: char-report; reports the graphics system status encoded into the seven bits of an ASCII character, shown in the following table.

B7	B6	B5	B4	B3	B2	B1
0	1	HCU	NOLI	GRAPH	0	1

Bits 7 and 6 are always set to 0 and 1, respectively; Bits 2 and 1 are also set to 0 and 1, respectively.

The HCU (Bit 5) is set to 0 if a copier is attached to the COPIER port and is ready to accept a copy request; otherwise this bit is set to 1.

Bits 4 and 3 indicate the graphics system's Implicit command mode status as shown in the following table.

NOLI	GRAPH	Mode Status
0	0	The graphics system is in Marker mode
0	1	The graphics system is in Alpha mode
1	0	The graphics system is in Vector mode
1	1	This combination doesn't occur

For example, if the graphics system (1) has a hardcopy unit attached, (2) is ready for a hardcopy command, and (3) is in Vector mode, the bits sent are:

0 1 0 1 0 0 1

The corresponding character on the ASCII chart is the closing parenthesis ")" which would be transmitted as the status byte.

point-report: the location of the graphic cursor (if 4010 GIN is enabled) or the graphics position (if 4010 GIN is not enabled). The point is reported in either *xy+ report* or *10-bit-xy report* format.

If the graphics system's Coordinate mode is 1, then the *point-report* is formatted as an *xy+ report*.

If the graphics system's Coordinate mode is 0, then the *point-report* is in the *10-bit-xy report* format.

REPORT-COLORHARDCOPY-STATUS

REPORT-COLORHARDCOPY-STATUS

§6 Reports

Causes the graphics system to send the host a status report on the device connected to the graphics system's COPIER port.

Syntax

Tek: E_cQQ

Setup: E_cQQ

STI: LLQQR

Parameters

None

Description

The REPORT-COLORHARDCOPY-STATUS command causes the graphics system to send a Colorhardcopy-Status-Report to the host computer.

The Colorhardcopy-Status-Report Format

This report gives the device type, device characteristics, and device status of the copier connected to the graphics display COPIER port.

Colorhardcopy-Status-Report=

sig-char

char-report: **Q**

char-report: **Q**

int-report: *device-characteristics*

int-report: *device-ID*

int-report: *copier-version-and-option-number*

int-report: *long-axis-device-addressability*

int-report: *short-axis-device-addressability*

int-report: *copies-in-queue*

int-report: *error-code*

EOM-indicator

The following describes the elements of the Colorhardcopy-Status-Report.

device-characteristics: int-report; the following shows the definition of the bits in this portion of the report.

Device-Characteristics Bit Definitions

B15	B14	B13	B12	B11	B10	B9	B8
X	X	X	X	X	X	X	X

B7	B6	B5	B4	B3	B2	B1	B0
S	S	S	T	P	N	N	M

The meanings of the bits are as follows:

X Reserved for future use (zero).

S Media size. These three bits specify the size of the media loaded into the copier:

Media-Size Bit Definitions

B7	B6	B5	Media Size
0	0	0	A (8.5" x 11")
0	0	1	B (11" x 17")
0	1	0	C (17" x 22")
0	1	1	D (22" x 34")
1	0	0	A4 (297 x 210 mm)
1	0	1	A3 (420 x 297 mm)
1	1	0	A2 (594 x 420 mm)
1	1	1	A1 (840 x 594 mm)

T Media type: 0 = Paper, 1 = Transparency

P Copy process: 0 = Non-interruptible, 1 = Interruptible

N Number of passes (a copier specification): the actual number of passes is one greater than the number specified in the two-bit field (B2 and B1).

M Imaging/media relationship: 0 = Image parallel to short axis of media, 1 = Image parallel to long axis of media.

The 4696 always reports B-size media as the media type, regardless of what is actually in the copier.

The 4693D reports legal-size paper (8.5" x 14") as B-size and A4-special paper (slightly longer than A-4) as A3-size.

device-ID: int-report; an integer that identifies the model of Tektronix color copier or the hardcopy interface selected for non-Tektronix printers. Possible values include 4690, 4692, 4693, and 4696; for other printers (such as Hewlett-Packard LaserJet+ and ThinkJet), the device ID is reported as the HCINTERFACE *copier-type*. A value of 4690 is reported if a copier is not connected, not powered up, or is busy.

copier-version-and-option-number: int-report; a three digit integer that, when interpreted as a hexadecimal value, identifies the copier version and option number. The first two digits represent the copier version, and the last digit represents the option number. For example, if the integer returned is "100," then the version number is 1.0, and the option number is 0 (that is, no options installed).

long-axis-device-addressability: int-report; an integer that specifies the maximum pixels the image contains in the direction of the long axis.

Long-Axis Addressability		
Device	Media Size	Pixels
4692	All sizes	1536
4693D	A-size	2492
	Legal	3198
	A4-size	2700
	A4-special	3198
4696	All sizes	32767
ColorQuick	A-size	2203
	B-size	3499
DeskJet	All sizes	1500
FX-80	All sizes	1024
LA210	B-size	32767
LaserJet+	All sizes	1500
LN03	A-size	1280
LQ-2500	B-size	32767
ThinkJet	All sizes	1280

short-axis-device-addressability: int-report; an integer that specifies the maximum pixels the image contains in the direction of the short axis.

Short-Axis Addressability		
Device	Media Size	Pixels
4692	All sizes	1152
4693D	A-size	2440
	Legal	2440
	A4-size	2368
	A4-special	2368
4696	Width 0	960
	Width 1	1024
ColorQuick	A-size	1778
	B-size	2318
DeskJet	All sizes	1200
FX-80	All sizes	960
LA210	B-size	1250
LaserJet+	All sizes	1024
LN03	A-size	1024
LQ-2500	B-size	1280
ThinkJet	All sizes	1024

copies-in-queue: int-report; the number of copies requested but not yet copied. The range of this report is 0 through 65535.

error-code: int-report; the following table shows the definition of the bits in this portion of the report.

Error-Code Bit Definitions							
B15	B14	B13	B12	B11	B10	B9	B8
X	X	X	X	X	L	P	B

B7	B6	B5	B4	B3	B2	B1	B0
T	C	I	E	U	F	J	O

The meanings of the bits (when set to 1 rather than 0) are as follows:

- X Reserved for future use (zero).
- L Line-count error: error in number of lines transmitted per copy.
- P Bit-prompt error: error in number of bit prompts sent in status message.
- B Byte-count error: error in number of bytes sent in Raster Data Transmission.
- T Time-out error: idle time exceeded.
- C Checksum error: command preamble data string in error.
- I Inconsistent preamble data.
- E Unexpected command.
- U Undefined command.
- F Fatal device error.
- J Media jam.
- O Out of consumables: (media, toner, ink, etc.).

For the 4696, Epson FX-80, LaserJet+, and ThinkJet, these error codes will always be zero.

REPORT-DEVICE-STATUS

REPORT-DEVICE-STATUS

§6 Reports

Causes the graphics system to send a Device-Status-Report to the host.

Syntax

Tek: \mathbb{R}_c JQ device: *device-specifier*

Setup: \mathbb{R}_c JQ string: *device-specifier*

STI: LLJQRY (*length, device-specifier*)

Parameters

device-specifier

Specifies the device whose status is to be reported to the host. See the device parameter type for valid devices.

Defaults: After FACTORY = (none)
Omitted = Error JQ11 (Level 2)

Description

This command causes the graphics system to send a Device-Status-Report for the specified device to the host computer.

When the parser detects an error in the parameter because it is not a syntactically valid string or there is not enough memory to parse it, no report is sent.

The Device-Status-Report Format

This report contains information on devices attached to the graphics system.

Device-Status-Report = [char-report: *signature-character*]
char-report: *first-device-character*
char-report: *second-device-character*
int-report: *status-word*
EOM-indicator

signature-character: The signature character for non-GIN reports (see RSIGCHARS).

first-device-character and *second-device-character*: two character reports; specifies the device whose status is being reported (such as P0). Both are reported as \mathbb{R}_p when device-specifier is invalid.

status-word: int-report; reports the device status with possible values 0 to 65535. As described below, its bits hold status information about the device.

If Error JQ11 (Level 2) is detected, *status-word* is reported as 0.

EOM-indicator: The EOM indicator is always sent to end the report.

The following table lists the possible values of the bits in *status-word* for the different mappings (see DMAP) of all possible installed devices:

Device	Status-Word (Bit Settings)			
HC:	0000	0100	IAXX	CFB1
HO:/SP0	0000	0000	XXXX	XXB1
HO:/NTN	0000	0111	XXXX	XXB1
P0:	0000	0001	XXXX	XXB1
P1:	0000	0010	XXXX	XXB1
SC:	0000	0000	XXXX	XX01

The meanings of these bits (when set to 1 rather than 0) are as follows:

- A The copier has acknowledged a data transfer.
- B The device is busy.
- C The copier is connected and powered up.
- F A copier fault condition exists.
- I The copy is parallel to the long axis of the media.
- X No meaning (reserved for future use).

REPORT-ERRORS *REPORT-ERRORS*

§6 Reports

Causes the graphics system to send an Error-Report message to the host and empties the error queue.

Syntax

Tek: *␣cKQ*

Setup: *␣cKQ*

STI: *LLKQRY*

Parameters

None

Description

The REPORT-ERRORS command causes the graphics system to send an Errors-Report message to the host and empties the error queue.

The Error-Report Format

This report is actually a series of up to eight *reports-for-one-error*, followed by the terminating signature character and the EOM indicator.

Error-Report = *[report-for-one-error ...]*
[term-sig-char]
EOM-indicator

The graphics system sends a *report-for-one-error* for each of the eight most recently detected error codes. If fewer than eight errors have been detected since power-up or since the last REPORT-ERRORS command, the graphics system sends all the *reports-for-one-error*.

Each *report-for-one-error* describes an error in the following format:

report-for-one-error = *leading-EOM-indicator*
[char-report: sig-char]
char-report: first-command-char
char-report: second-command-char
char-report: parameter-number
char-report: error-type
int-report: severity-level
int-report: error-count
[EOM-indicator] (if REOM = 1)

The following describes the elements of the *report-for-one-error* in an Error-Report.

first and second-command-character: two char-reports; specifies the command that caused the error.

parameter-number: char-report; identifies the command parameter associated with the error.

error-type: char-reports; consists of an error-type digit. Refer to Appendix A for an explanation and list of error codes.

severity-level: int-report; specifies the severity level of the error that occurred; see Appendix A for an explanation of severity levels.

error-count: int-report; the number of times the graphics system has detected that error since power-up or since the last REPORT-ERRORS command. If the graphics system has detected the error more than 255 times, it reports the error has occurred 255 times.

After the last *report-for-one-error*, the graphics system sends a terminating signature character and an EOM indicator.

REPORT-GIN-POINT

REPORT-GIN-POINT

§6 Reports

Forces the graphics system to send a GIN report to the host.

Syntax

Tek: ^EcIP int: *report-code*
Setup: ^EcIP integer: *report-code*
STI: LLPTGN (*report-code*)

Parameters

report-code

Specifies the device-function or special function that is to send a report.

-2 The current graphics position
8D+F Where device *D* = 0 to 4 and 6 to 8
 Function *F* = 0, 1, or 2, (Locator, Pick, or Stroke)

Defaults: After FACTORY = (none)
 Omitted = 0

The GIN-Report Format

A GIN report consists either of a signature character and function reports, or just a termination report. Here is the general format of a GIN report:

GIN report = [EOM-indicator]
 [char-report:sig]
 GIN-function-report
 [EOM-indicator]
 or
 GIN-termination-report

The *GIN-function-report* consists of *one* of these function reports:

GIN-function-report = *GIN-locator-report*
 GIN-pick-report
 GIN-first-stroke-report
 GIN-subsequent-stroke-report
 GIN-last-stroke-report

The structure of each of the function reports and the GIN-termination report follows:

GIN-locator-report = char-report:*key*
 xy+ report:*GIN-location*
 [int-report:*view-number*]

GIN-pick-report = char-report:*key*
 xy+ report:*GIN-location*
 [int-report:*view-number*]
 segment-pickID-report

segment-pickID-report =
 int-report:*segment-number*
 int-report:*pickID-number*
 or
 int-array-report:*segment-number/pickID*

GIN-first-stroke-report =
 char-report:*key*
 xy+ report:*GIN-location*
 [int-report:*view-number*]

GIN-subsequent-stroke-report =
 char-report:"J"
 xy+ report:*GIN-location*
 [int-report:*view-number*]

GIN-last-stroke-report =
 char-report:"O"
 xy+ report:*GIN-location*
 [int-report:*view-number*]

GIN-termination-report =
 [char-report:*term-sig-char*]
 EOM-indicator

Each item in the following list explains a part of the function report that is unique to reports from the GIN system.

- *key* or *key-number*: reports the trigger-character that initiates the GIN report. Triggers and trigger-characters are discussed in the concepts part of this section under "Physical GIN Devices." You can also find information in the GINENABLE command description.
- *GIN-location*: reports the last position that the GIN device moved the GIN cursor segment to. For additional information, see the GINCURSOR command description in this section, and the discussion of the *xy+-report* in the *Reports* section.

- *view-number*: for Locator and Stroke, reports the view whose window is associated with the GIN area containing the GIN space value. For more information, refer to the "GIN Area" discussion in the concepts part of this section.

For Pick, *view-number* reports the view that the picked segment is in. If the picked segment is 0 (none picked), then the view associated with the GIN area is sent as for Locator and Stroke, but only when the current GIN report format is 4 to 7 (refer to "Formatting GIN Reports" in the concepts part of this section).

When REPORT-GIN-POINT queries the current graphic position (the *report-code* value is -2), *view-number* reports the view currently selected by VSELECT.

- *segment-pickID-report*: reports the segment number and Pick-ID number. The int-array-report is sent instead of the two int-reports when the current GIN report format is 1, 3, 5, or 7 (refer to "Formatting GIN Reports").

When two int-reports are sent, the first int-report gives the number of the segment being "picked." If no visible, detectable segment with a non-zero Pick-ID falls within the current Pick aperture, this int-report is 0.

The second of the two int-reports gives the "Pick-ID number" of a part of the segment within the Pick aperture. If no visible-detectable segment with a non-zero Pick-ID falls within the Pick aperture, then this int-report is 0. This Pick-ID is the one associated with the picked primitive, at the lowest level called segment (if any).

When the int-array-report is sent, it contains segment-number/Pick-ID pairs that define the Pick path through the segment calling tree. The first pair is for the top-level segment and the last pair is for the deepest called segment. The last Pick-ID is the one associated with the picked primitive, while the other Pick-IDs are the ones in effect for each of the segment calls.

- *GIN-termination-report*: is sent to the host when the GIN device is disabled and consists of the *term-sig-char*, which is set by the RSIGCHARS command described in the *Reports* section.

REPORT-NETWORK-SETTINGS

REPORT-NETWORK-SETTINGS

§6 Reports

Causes the graphics system to send a Network-Settings-Report to the host computer. Requires LAN option (Option 3H).

Syntax

Tek: $\text{\textasciitilde{c}}\text{OQ}$ char: *first*
 char: *second*

Setup: $\text{\textasciitilde{c}}\text{OQ}$ char: *first*
 char: *second*

STI: LLRNST (length, first-second-array)

Parameters

first

Specifies the inquiry code ASCII character. Valid entries are X or V (ADE 88 or 86).

Defaults: After FACTORY = (none)
 Omitted = Error OQ11 (Level 2)

second

Specifies the second inquiry code ASCII character. Valid entries are 0 to 9 (ADE 48 to 57).

Defaults: After FACTORY = (none)
 Omitted = Error OQ21 (Level 2)

Description

This command causes the graphics system to send a Network-Settings-Report to the host computer.

No report is issued when the Tek parser detects a syntactic error in a parameter.

Network-Settings-Report Format

This report contains information on network addresses and settings, such as Internet-term-address, LAN-internet-address, Telnet-settings.

Network-Settings-Report = [leading-EOM-indicator]
 [signature-char]
 opcode-report
 [parameter-report ...
 EOM-indicator

opcode-report = char-report: X or V
 char-report: 1, 2, 3, 4, or 5

parameter-report = char-array-report

Command Summary

opcode-report: char-array-report; consists of two character reports:

- The first character is either an *X* or *V* depending on whether the SET-NET-ADDRESSES command (and its Setup commands, IBROADCAST, IGATEADDRESS, IHOSTADDRESS, ILANADDRESS, and ITERMADDRESS) or the SET-TELNET-ATTRIBUTES command (and its Setup Commands, TDATA, TESCAPE, TLOCAL, and TPASSTHRU) is used to set the attribute being reported.
- The second is the number associated with the settings being reported. The currently defined values are 1 to 5, as listed below.

parameter-report: char-array-report; indicates the address or setting of a network parameter specified in the REPORT-NETWORK-SETTINGS command. Valid inquiry codes that are not currently defined (that is V6 to V9 and X6 to X9) return a zero-length char-array report.

All possible opcode and parameter reports available in the Network-Settings-Report are listed in the following table. The paragraphs following the table describe each report in detail.

**Special Inquiry Codes for
the Network-Settings-Report**

Inquiry Code	Report Parameter	Setup Command
X 1	<i>internet-graphics-system-address</i>	ITERMADDRESS<a>
X 2	<i>internet-host-addresses</i>	IHOSTADDRESS<a>
X 3	<i>internet-lan-addresses</i>	ILANADDRESS<a>
X 4	<i>internet-gateway-addresses</i>	IGATEADDRESS<a>
X 5	<i>internet-broadcast</i>	IBROADCAST<a>
V 1	<i>telnet-escape-character</i>	TESCAPE
V 2	<i>telnet-data-mode</i>	TDATA
V 3	<i>telnet-local-mode</i>	TLOCAL
V 4	<i>telnet-passthru-mode</i>	TPASSTHRU
V 5	<i>telnet-NVT-end-of-line-character</i>	TCR

<a> Set from host with SET-NET-ADDRESSES.

 Set from host with SET-TELNET-ATTRIBUTES.

Internet Graphics System Address

char-array-report: *internet-graphics-system-address*

This array contains the *internet-graphics-system-address*, which is set from the host with the SET-NET-ADDRESSES command and set from the keyboard with the ITERMADDRESS command. The array consists of four fields separated by slashes (/) — ADE 47.

- The *graphics system name* — a user- or network-administrator-assigned string consisting of 1 to 32 ASCII characters in the range A to Z, a to z, minus (-), underscore (_), and period (.) — ADE 65 to 90, 97 to 122, 45, 95, and 46.
- The *Internet address* — four or five subfields that are defined in ways that are network dependent. The subfields are separated by periods (.) — ADE 46. Each subfield is a string of 1 to 15 digits in the range 0 to 9 (ADE 48 to 57) representing a whole number.
- The *LAN address* — each subfield is a two-digit hex number separated by colons (:) — ADE 58.
- The *netmask* — used to determine the network and subnet portions of the Internet address. The subfields are separated by periods (.) — ADE 46. The subfields each consist of an integer in the range 0 to 255.

For example:

```
STATION1/6.128.125.42/01:AB:E0:12:34:07:/  
255.0.0.0
```

Internet Host Addresses

char-array-report: *internet-host-addresses*

This array contains the *internet-host-addresses*, which are set from the host with the SET-NET-ADDRESSES command and set from the keyboard with the IHOSTADDRESS command. The array consists of a series of name-address fields separated by slashes (/) — ADE 47.

- The *name-field* — the name by which a remote host or device is known on the network. This is a string consisting of 1 to 32 ASCII characters in the range A to Z, a to z, minus (-), underscore (_), and period (.) (ADE 65 to 90, 97 to 122, 45, 95, and 46).
- The *address-field* — the Internet address, consisting of four or five subfields that are defined in ways that are network dependent. The subfields are separated by periods (.) — ADE 46. Each subfield is a string of 1 to 15 digits in the range 0 to 9 (ADE 48 to 57) representing a whole number.

For example:

```
HOST1/6.128.125.42 /HOST2/6.15.14.12 /  
JOHNHOST/17.128.100.10
```


Internet LAN Addresses

char-array-report: *internet-lan-addresses*

This array contains the *internet-lan-addresses*, which is set from the host with the SET-NET-ADDRESSES command or from the keyboard with the ILANADDRESS command. The array consists of a series of entries with two major fields separated by slashes (/) — ADE 47.

- The *internet-address* — four or five subfields that are defined in ways that are network dependent. The subfields are separated by periods (.) — ADE 46. Each subfield is a string of 1 to 15 digits in the range 0 to 9 (ADE 48 to 57) representing a whole number.
- The *lan-address* — contains the IEEE-802 or Ethernet address and consists of six subfields separated by a colon (ADE 58). Each subfield represents the hex value of a byte in the Local Area Network address. Each subfield consists of two ASCII characters in the range 0 to 9, A to F, and a to f (ADE 48 to 57, 65 to 70, and 97 to 102).

For example:

```
6.128.125.42/12:00:34:AC:44:CC /6.15.14.12/
12:34:56:78:9A:BC
```

Internet Gateway Addresses

char-array-report: *internet-gateway-addresses*

This array contains the *internet-gateway-addresses*, which are set from the host with the SET-NET-ADDRESSES command or from the keyboard with the IGATEADDRESS command. The array consists of a series of entries with three major fields, delineated by slashes (/) — ADE 47.

- The *network-number* — two subfields, *network-number* and the *subnet-number*. Each subfield is a string of 1 to 15 digits in the range 0 to 9 (ADE 48 to 57) representing a whole number. The subfields are separated by periods (.) — ADE 46.
- The *internet-address* — four or five subfields that are defined in ways that are network-dependent. The subfields are separated by periods (.) — ADE 46. Each subfield is a string of 1 to 15 digits in the range 0 to 9 (ADE 48 to 57) representing a whole number.
- The *net-mask* — a string of one or two characters that represents in decimal the number of bits in the combined network and subnet part of the Internet address.

For example:

```
16.0.0.0/6.128.125.42/255.0.0.0 /
128.7.0.0/6.128.125.42/255.0.0.0 /
222.7.6.0/6.128.1.1/255.0.0.0
```

Internet Broadcast Mode

char-array-report: *internet-broadcast-mode*

This field contains the *internet-broadcast-mode*, which is set from the host with the SET-NET-ADDRESSES command and set from the keyboard with the IBROADCAST command. The field consists of one character, either an *I* (ADE 49) or a *O* (ADE 48), representing whether the current Internet broadcast is all zeros or ones.

Escape-to-Local Character

char-array-report: *escape-to-local-character*

This array contains the *escape-to-local-character*, which is set from the host with the SET-TELNET-ATTRIBUTES command and set from the keyboard with the TESCAPE command. The array is a series of entries with three major fields separated by slashes (/) — ADE 47.

- The *logical-device* — two characters that define a virtual device. The colon (:) in the virtual device identifier is assumed and does not show up as part of the identifier. HO: is the only logical device currently allowed.
- The *connection-status* — a single-character field indicating the current state of the connection. This character will either be a *C* (ADE 67) for *connected* or *U* (ADE 85) for *unconnected*.
- The *telnet-escape-character* — from 0 to 3 digits in the range 0 to 9 (ADE 48 to 57) representing the ADE of the Telnet escape character.

For example:

```
HO/C/126
```

Network Data Mode

char-array-report: *telnet-data-mode*

This array contains the *telnet-data-mode*, which is set from the host with the SET-TELNET-ATTRIBUTES command and set from the keyboard with the TDATA command. The array is a series of entries with five major fields separated by slash (/) — ADE 47.

- The *logical-device* — two characters that define a virtual device. The colon (:) in the virtual device identifier is assumed and does not show up as part of the identifier. HO: is the only logical device currently allowed.
- The *connection-status* — a single-character field indicating the current state of the connection. This character will either be a *C* (ADE 67) for *connected* or *U* (ADE 85) for *unconnected*.

Command Summary

- The *network-data-mode* — the third, fourth, and fifth fields are one-character fields indicating the host is requesting to send and receive either binary or ASCII data, indicating that the host will send binary or ASCII data, and indicating that the host will receive binary or ASCII data, respectively. The characters in these fields will be *a* and *A* (ADE 65) for ASCII data or a *B* (ADE 66) for binary data.

For example:

HO/C/A/A/A

Telnet Local Mode

char-array-report: *telnet-local-mode*

This array contains the *telnet-local-mode*, which is set from the host with the SET-TELNET-ATTRIBUTES command and set from the keyboard with the TLOCAL command. The array is a series of entries with three major fields separated by slash (/) — ADE 47.

- The *logical-device* two characters that define a virtual device. The colon (:) in the virtual device identifier is assumed and does not show up as part of the identifier. HO: is the only logical device currently allowed.
- The *connection-status* — a single-character field indicating the current state of the connection. This character will either be a *C* (ADE 67) for *connected* or *U* (ADE 85) for *unconnected*.
- The *telnet-mode* an *L* (ADE 76) for local Telnet mode or a *H* (ADE 72) for talking to a host.

For example:

HO/C/L

Telnet Passthru Mode

char-array-report: *telnet-passthru-mode*

This array contains the *telnet-passthru-mode*, which is set from the host with the SET-TELNET-ATTRIBUTES command and set from the keyboard with the TPASSTHRU command. The array is a series of entries with three major fields separated by slash (/) — ADE 47.

- The *logical-device* two characters that define a virtual device. The colon (:) in the virtual device identifier is assumed and does not show up as part of the identifier. HO: is the only logical device currently allowed.
- The *connection-status* — a single-character field indicating the current state of the connection. This character will either be a *C* (ADE 67) for *connected* or *U* (ADE 85) for *unconnected*.
- The *telnet-passthru-mode* — *P* (ADE 80) for passthru mode on, or *N* (ADE 78) for passthru mode off.

For example:

HO/C/P

Network Virtual Terminal End-of-Line Character

char-array-report: *NVT-end-of-line-character*

This array contains the *NVT-end-of-line-character*, which is set from the host with the SET-TELNET-ATTRIBUTES command and set from the keyboard with the TCR command. The array is a series of entries with three major fields separated by slash (/) — ADE 47.

- The *logical-device* two characters that define a virtual device. The colon (:) in the virtual device identifier is assumed and does not show up as part of the identifier. HO: is the only logical device currently allowed.
- The *connection-status* — a single-character field indicating the current state of the connection. This character will either be a *C* (ADE 67) for *connected* or *U* (ADE 85) for *unconnected*.
- The *NVT-end-of-line-character* — *0* (ADE 49) for $c_R^N U$, or *1* (ADE 50) for $c_R^L F$.

For example:

HO/C/0

REPORT-PORT-STATUS

REPORT-PORT-STATUS

§6 Reports

Causes the graphics system to send a Port-Status-Report for the specified logical serial port to the host computer.

Syntax

Tek: ^{Ec}PQ device: *port*
Setup: ^{Ec}PQ string: *port*
STI: LLPQRY (*length, port*)

Parameters

port:

Specifies the peripheral port whose status is to be reported.

P0: Peripheral Port 0.

P1: Peripheral Port 1.

Defaults: After FACTORY = none
 Omitted = error PQ11 (Level 2)

Description

The REPORT-PORT-STATUS command causes the graphics system to send a Port-Status-Report to the host for the specified logical serial port.

No report is issued if the Tek parser detects a syntactic error in a parameter.

If *port* is invalid (that is, if it is not P0: or P1:), the graphics system detects a PQ11 (Level 2) error. Nevertheless, it still sends a Port-Status-Report to the host computer. That report, however, is abbreviated; its *port-ID-code* consists of two "space" characters, and the *port-information* is omitted.

The Port-Status-Report Format

The Port-Status-Report is sent in response to the REPORT-PORT-STATUS command.

Port-Status-Report = [char-report: *sig-char*]
 port-identifier
 port-information
 [EOM-indicator]

port-identifier: two char-reports; names the peripheral port the Port Status Report is reporting on. The four possible values are:

P0 = PORT 0

P1 = PORT 1

P2 = PORT 2

^{s_rs_r} = Indicates an invalid *port-specifier*

port-information: a series of *int-reports*, *string-reports*, and *int-array-reports*; reports the current values of the port's communication settings. (If the *port-identifier* is ^{s_rs_r}, the *port-information* parameter is omitted.) The settings are reported in this order:

int-report: *baud-rate*

int-report: *parity*

int-report: *stop-bits*

int-report: *data-bits*

int-report: *flagging-mode*

int-report: *flagging-"go"-character*

int-report: *flagging-"stop"-character*

string-report: *protocol*

int-array report: *EOF-string*

int-array report: *EOL-string*<¹>

The *string-report* for the device protocol is always ten characters long, with the actual protocol characters in the first position.

<¹> The EOL-string always reports as a zero-length array.

REPORT-SEGMENT-STATUS

REPORT-SEGMENT-STATUS

§6 Reports

Requests a *segment-status-report* from the graphics system.

Syntax

Tek: $\text{\textasciitilde{c}SQ}$ int: *segment-number*
 char-array: *status-codes*

Setup: $\text{\textasciitilde{c}SQ}$ integer: *segment-number*
 delim-string: *status-codes*

STI: LLSQRY (*segment-number, length, status-codes*)

Parameters

segment-number

The segment for which you want information.

- 5 Called segments.
- 3 All segments that match the current matching class.
- 2 Future segments.
- 1 All existing segments.
- 0 The crosshair cursor.
- 1 to 32767 A specific segment.
- Defaults: After FACTORY = (none)
 Omitted = 0

status-codes (length 0 to 65535)

An array specifying the information to be returned for the specified segment.

- A Classes
- D Detectability
- H Highlighting mode
- I Image transform
- M Writing mode
- P Pivot point
- S Display priority
- V Visibility
- X Position
- Defaults: After FACTORY = (none)
 Omitted = Empty array

Description

This command causes the graphics system to send one or more Segment-Status-Reports to the host computer. If you enter this command in Setup mode, the report is sent to the host or, if in Local mode, to the screen.

No report is issued if the Tek or Binary parser detects a syntactic error in a parameter.

A segment number in the range from 1 to 32767 specifies a single user-defined segment. An error is detected if the specified segment does not exist.

Segment 0 refers to the crosshair GIN cursor.

Segment -1 refers to all currently defined segments (with numbers from 1 to 32767).

Segment -2 refers to future segments.

Segment -3 refers to all segments that match the current segment matching class.

Segment -5 refers to a segment that is called with the SGCALL command. Refer to the SGCALL command for details. Segment-5 is only useful for reporting the matrix transform (other parameters are reported as factory defaults).

Status-codes specify which information about the segment (or segments) is to be reported. If it is empty (has a length of zero), then the only information in the Segment-Status-Report will be the segment number(s).

The Segment-Status-Report Format

The Segment-Status-Report is sent in response to the REPORT-SEGMENT-STATUS command.

Segment-Status-Report =
 [*report-for-one-segment*]
 [*term-sig-char*]
 [*EOM-indicator*]

Each *report-for-one-segment* describes the attributes of one segment with the following syntax:

report-for-one-segment =
 [*leading-EOM-indicator*]
 [*sig-char*]
 int-report: *segment-number-or-error-code*
 [*segment-attribute-report*]
 [*EOM-indicator*] (if REOM = 1)

The following paragraphs detail the parts of the *report-for-one-segment* in a Segment-Status-Report.

segment-number: int-report; specifies the segment number being described, or a special error code.

If the REPORT-SEGMENT-STATUS command specified an invalid segment number, a segment number for a segment which does not exist, or an invalid code letter for a segment attribute, then the Segment-Status-Report sent back to the host includes an error code. In that case, the *report-for-one-segment* has the special error code integer in place of the segment number, and there are no *segment-attribute-reports*. These special error codes are listed in the following table.

Error Code	Meaning
-32767	The segment number in REPORT-SEGMENT-STATUS was invalid
-32766	The REPORT-SEGMENT-STATUS command specified a segment number for a nonexistent segment
-32765	The REPORT-SEGMENT-STATUS command included an invalid status code letter

In addition to the error information in the Segment-Status-Report, type SQ10, SQ11, and SQ21 errors are detected in the graphics system. These error codes will be sent to the host if a REPORT-ERRORS command is issued. (For details, see the description of the REPORT-ERRORS command.)

attribute-report: The report parameter type depends on the query; reports the status of the segment's attributes, as requested in the REPORT-SEGMENT-STATUS command.

There is one *attribute-report* for each attribute, and each *attribute-report* starts with the code letter for that attribute. The type of report parameter returned for *attribute-report* depends on the type of parameter used to set the attribute queried. The report parameter types, along with the status codes for each attribute, are listed below.

Status Code	Attribute	Report Format
A	Segment classes	char-report: A int-array-report: <i>class-numbers</i>
D	Detectability	char-report: D int-report: <i>0 or 1</i>
H	Highlighting	char-report: H int-report: <i>0 or 1</i>
I	Image transform	char-report: I real-report: <i>x-scale-factor</i> real-report: <i>y-scale-factor</i> real-report: <i>rotation-in-degrees</i> xy+ report: <i>position</i>
M	Writing mode	char-report: M int-report: <i>1 to 4</i>
P	Pivot point	char-report: P xy+ report: <i>pivot-point</i>
S	Display priority number	char-report: S int-report: <i>display-number</i>
V	Visibility	char-report: V int-report: <i>0 or 1</i>
X	Position	char-report: X xy report: <i>position</i>

The value that you get back in a report is the same value that was set with the initial command. However, keep in mind that the parameter is encoded when issued, and encoded when reported, but that these encoding schemes are different.

The *pivot-point-report* and *position-report* are returned as 2-D points.

REPORT-TERMINAL-SETTINGS

REPORT-TERMINAL-SETTINGS

§6 Reports

Causes a Terminal-Settings-Report to be sent to the host.

Syntax

Tek: ^EcIQ char: *first*
 char: *second*

Setup: ^EcIQ char: *first*
 char: *second*

STI: LLIQRY (*first-second* [one string, two
 characters])

Parameters

first

Specifies the first character of a two letter opcode or the first inquiry code ASCII character. Valid values are ADE 32 to 126 and 160 to 255.

Defaults: After FACTORY = (none)
 If omitted = ^SP

second

Specifies the second character of a two letter opcode or the second inquiry code ASCII character. Valid values are ADE 32 to 126 and 160 to 255.

Defaults: After FACTORY = (none)
 If omitted = ^SP

Description

This command causes the graphics system to send a Terminal-Settings-Report to the host computer.

The Terminal-Settings-Report Format

The Terminal-Settings-Report is sent in response to a REPORT-TERMINAL-SETTINGS command.

Terminal-Settings-Report =
 [*leading-EOM-indicator*]
 [*sig-char*]
 opcode-report
 [*parameter-report...*]
 EOM-indicator

opcode-report: two char-reports; the two *chars* being reported are the same two characters that were used in the REPORT-TERMINAL-SETTINGS command; they comprise either an opcode for one of the graphics system's Tek commands, or else a special inquiry code.

However, if the REPORT-TERMINAL-SETTINGS command specified an opcode for a command that does not exist, or that is not installed in the graphics system, then the *opcode-report* is ^SP^SP.

The following table lists the special inquiry codes, their Setup names (for use with STATUS), and their associated *parameter-reports*.

Code	Setup Name and Parameter-Reports
4K	^E c4K int-report : 0 if the keyboard is not Katakana (option 4K), the same as for 00 (described later) if it is.
?A	AMEMORYBLOCKS intc-report : total memory intc-report : largest-contiguous-block (the total memory, and the size of the largest contiguous block, are reported as a number of 16-byte units of memory)
?B	BUFFERS int-array-report : see "Frame Buffer Reports," which follows.
?K	^E c?K int-report : 0 if option 4L (Kanji) is not installed (if the option is installed, the report is the same as for 00, described later)
?M	MEMORYBLOCKS int-report : available-memory int-report : largest-contiguous-block (the available memory, and the size of the largest contiguous block, are reported as a number of 16-byte units of memory)
?P	PMEMORYBLOCKS intc-report : available segment memory intc-report : largest contiguous block (both reported as a number of 16-byte units of memory)
?R	SCREENSIZE int-array-report : length 2; first element: frame buffer width; second element: frame buffer height.
?T	TERMINAL int-report : model-number-code of the graphics system.
00	VERSION int-report: standard-software-version-number (the version of the graphics system software)

Code Setup Name and Parameter-Reports

- 01 to 98 E_{c01} to E_{c98}
 int-report : optional-software-version number (if
 a software option is not installed, the *opcode-*
 report is S_{PSP} and this *int-report* is not sent)
- 99 LEVEL
 int-report : software-level-number (the level
 number of the graphics system's software)

Frame Buffer Reports

The TERMINAL-SETTINGS-REPORT for ?B is an *int-array-report* containing one or more pairs on *int-reports*. The first integer of each pair has a value from 0 to 3, indicating modes. The second integer of each pair has a value from 1 to 8, indicating the maximum number of bit planes that can be assigned to a surface when the graphics system is in the modes given in the first integer.

For the first integer, bit 0 is the Logical/Physical mode indicator, bit 1 is the Indexed Color mode indicator, and bit 2 is the Single Buffer mode indicator. (*Logical* mode means that the other modes are possible but may be emulated in software.)

For the 4211, the logical and physical capabilities are identical, so that each of the two reported first integers (SIL == 0 and SIP == 1) will have the same second integer value: the number of bit planes.

The following table shows what the second integer value is for each first integer value and each possible bit plane configuration. The letters represent the mode meanings.

First Integer		Second Integer (Bit Planes)	
Value	Mode	4	8
0	000=SIL	4	8
1	001=SIP	4	8

Thus, the array will always contain two pairs of integers, with one pair (0,n) representing n bit planes for single-buffered indexed-color logical capabilities, and another pair (1,n) representing n bit planes for single-buffered Indexed-color physical capabilities (for the 4211, "n" will always be 4 or 8).

To ensure compatibility with other current or future Tektronix terminal products, an application should search for an integer-pair of interest by matching the first-integers with a desired value. Do not assume that there will be a fixed number of integer-pairs, and do not assume that the integer-pairs will occur in a particular order in the array.

Parameter-Report

The *parameter-report* is in the following format:

```
parameter-report = (choose one)
                   char-report
                   int-report
                   intc-report
                   real-report
                   xy report
                   xy+ report
                   int-array-report
                   xy array-report
                   xy+ array-report
```

If the command being reported is inquireable, the Terminal-Settings-Report contains a *parameter-report* for each parameter in the command's syntax. A command is inquireable if the INQUIRY Command section of its command description in this manual includes the REPORT-TERMINAL-SETTINGS command. If the command is not inquireable, no *parameter-reports* are sent.

Most *parameter-reports* are mirror images of the parameters of the commands, containing identical values. For a few commands the meanings of the *parameter-reports* differ from the meanings of the parameters in the commands. These commands are:

CHARSIZE (escape code MU)
 CMAP (escape code TG)
 DACMAP (escape code TF)
 GRAY (escape code RG)
 HCFEATURES (escape code QX)
 LOCKVIEWINGKEYS (escape code RJ)
 PROMPTMODE (escape code NM)
 VCLUSTER (escape code RQ)

Parameter-Report: CHARSIZE

The report returned for the CHARSIZE command is composed of three *int-reports* that report the *area-selector*, *number-of-lines*, and *number-of-columns*. If a dialog area is enabled when the report is requested, the *area-selector* reported is 1, and the *number-of-lines* and *number-of-columns* reported are those of the enabled dialog area character size. If no dialog area is enabled, the *area-selector* reported is 0, and the *number-of-lines* and *number-of-columns* of the character size currently in effect in the graphics area is reported. The *number-of-lines* and *number-of-columns* may be 4014 sizes as set by the SET-4014-ALPHATEXT-SIZE command.

Parameter-Report: CMAP

This command has the syntax *^cTG int int-array (^cTG int int-array is the CMAP command)*. Therefore, a REPORT-TERMINAL-SETTINGS: TG command causes the graphics system to send to the host a Terminal-Settings-Report with the following syntax:

```
Terminal-Settings-Report =
    sig-char
    TG
    int-report:number-of-surfaces
    int-array-report:color-info
    EOM-indicator
```

Here, the *int-report* tells the number of surfaces currently defined, while the *int-array-report* contains information about the background color mixture, and about the color mixtures for each of the color indices on each of the surfaces. (This is different from the meaning these parameters have when they are in CMAP command sent from the host to the graphics system.)

```
int-array-report:color-info =
    int-report:number-of-int-reports-to-
    follow
    triple-report:background-color
    colors-for-one-surface...
```

```
colors-for-one-surface =
    int-report:negative-surface-number
    triple:color-coordinates-for-one-color-
    index...
```

```
triple-report = RGB-triple-report
                or CMY-triple-report
                or HLS-triple-report
                or Machine RGB-triple-report
```

```
RGB-triple-report = int-report:red-percentage
                    int-report:green-percentage
                    int-report:blue-percentage
```

```
CMY-triple-report = int-report:cyan-percentage
                    int-report:magenta-percentage
                    int-report:yellow-percentage
```

```
HLS-triple-report = int-report:hue-angle-in-degrees
                    int-report:lightness-percentage
                    int-report:saturation-percentage
```

```
Machine-RGB-report =
    int-report:machine-red-value
    int-report:machine-green-value
    int-report:machine-blue-value
```

The RGB, CMY, HLS, or Machine RGB (increased-resolution RGB) color coordinate system is used in the report, depending on which color specifying mode was selected by the most recent CMODE command.

Suppose, for instance, that HLS color coordinates are being used. (This is the default when the graphics system is turned on.) Consider the following *int-array-report*, with two surfaces defined:

```
int-array-report:color-info =
    int-report:17
    int-report:0
    int-report:0
    int-report:0
    int-report:-1
    int-report:120
    int-report:50
    int-report:100
    int-report:-2
    int-report:180
    int-report:50
    int-report:100
    int-report:240
    int-report:50
    int-report:100
    int-report:0
    int-report:100
    int-report:0
```

Here, the first *int-report* says that there are 17 *int-reports* to follow in the *int-array-report*.

The next three *int-reports* say that the background color is black (hue zero degrees, lightness zero, saturation zero).

The following four *int-reports* carry the numbers -1, 120, 50, 100. Thus, on Surface 1, color Index 1 is displayed as a red color (Hue 120 degrees, Lightness 50, Saturation 100). Since only one set of three coordinates follows the -1, there must be only one non-zero color index for that surface. In other words, Surface 1 has only one bit plane assigned to it.

Likewise, the next ten *int-reports* carry the numbers -2, 180, 50, 100, 240, 50, 100, 0, 100, 0. These give three sets of color coordinates for Surface 2. On that surface, color Index 1 is displayed as yellow (Hue 180, Lightness 50, Saturation 100), color Index 2 as green (Hue 240, Lightness 50, Saturation 100), and color Index 3 as white (Hue 0, Lightness 100, Saturation 0). Since three sets of color coordinates are reported for Surface 2, that surface must have two bit planes assigned to it.

Parameter-Report: DACMAP

This command has the syntax cTF *int-array*. Therefore, a REPORT-TERMINAL-SETTINGS: *TF* command causes the graphics system to send to the host a Terminal-Settings-Report in the same manner as described for CMAP.

Parameter-Report: GRAY

This command has the syntax cRG *int int-array*. Therefore, a REPORT-TERMINAL-SETTINGS: *RG* causes the graphics system to send a Terminal-Settings-Report message, which has two *parameter-reports*, of the *int-report* and *int-array-report* types. However, the meanings of these *parameter-reports* differ from those of the corresponding parameters in the GRAY command:

Terminal-Settings-Report =

sig-char

RG

int-report: number-of-surfaces

int-array-report: gray-levels-for-surfaces

EOM-indicator

In this Terminal-Settings-Report, the *int-report* tells how many surfaces are defined.

The *int-array-report* contains surface numbers (expressed as negative integers), followed by the gray-levels for each surface (expressed as positive integers). Consider, for instance, the following *int-array-report*:

int-array-report: (-1, 90, -2, 30, 60, 90)

This means that Surface 1 has color Index 1 set to 90% Lightness, while Surface 2 has color Index 1 set to 30%, color Index 2 set to 60%, and color Index 3 set to 90%. (Since color Index 0 always means transparent, no gray-level is reported for color Index 0.)

The number of gray-levels reported for each surface is one less than two to the power N, where N is the number of bit planes assigned to that surface. Thus, a surface with one bit plane has one gray-level reported, while a surface with two bit planes has three gray-levels reported. If a surface has zero bit planes, then no gray-levels are reported for it.

Consider, for instance, the following *int-array-report*:

int-array-report: (-1,-2,10,15,30,45,55,70,90)

This would be interpreted to mean that Surface 1 has no bit planes (and therefore no gray-levels to report), while Surface 2 has three bit planes. The gray-level for the color Index 1 on Surface 2 is 10%, that for color Index 2 on Surface 2 is 15%, and so on.

Parameter-Report: HCFEATURES

This command has the syntax cQX *int-array*. When issuing this command, the *feature-list* number is given along with the desired value associated with the feature. The command,

REPORT-TERMINAL-SETTINGS : QX

causes the graphics system to send the host a Terminal-Settings-Report with the following syntax:

Terminal-Settings-Report=

EOM-indicator

sig-char

QX

int-array-report

EOM-indicator

Consider, for instance, the following *int-array-report*:

int-array-report: (5,500,10,5,60,1)

Note that the features-list number is not included in this array. The array reported specifies that:

- o It contains an array of 5 elements.
- o 500 blocks of memory are reserved for making copies in background.
- o 10 blank lines will appear at the top of each page being copied.
- o 5 blank lines will appear at the bottom of each page being copied.
- o 60 lines of text will be printed per page for dialog copies (if 60 lines are available).
- o The paper will be advanced after each copy on continuous feed copiers.

Parameter-Report: LOCKVIEWINGKEYS

This command takes the form RJ int . Therefore, a REPORT-TERMINAL-SETTINGS: RJ command causes the graphics system to send a Terminal-Settings-Report which has one *parameter-report*, of the *int-report* type:

```
Terminal-Settings-Report =
    EOM-indicator
    sig-char
    RJ
    int-report :viewing-key-status
    EOM-indicator
```

In this report, however, the viewing key status integer can assume more values than just 0 and 1. It can assume values from 0 to 3. The meanings of these are as follows:

- 0 The graphics system is in not in a Local Viewing function. (Neither in the ZOOM function nor in the PAN function). Moreover, the viewing keys are not locked (this does not preclude the entire keyboard's being locked as a result of a lock-keyboard command.)
- 1 The graphics system is in ZOOM function.
- 2 The graphics system is in PAN function.
- 3 The viewing keys are locked. (Therefore, the graphics system is neither in ZOOM function nor in PAN function.)

Parameter-Report: PROMPTMODE

Prompt mode can be turned on with a parameter of 1 or 2. However, the graphics system only reports whether the Prompt mode is on (1) or off (0).

Parameter-Report: VCLUSTER

This command has the syntax RQ int-array . Therefore, the command,

```
REPORT-TERMINAL-SETTINGS : RQ =  $\text{RJ IQRQ}$ 
```

causes the graphics system to send to the host a Terminal-Settings-Report with the following syntax:

```
Terminal-Settings-Report=
    EOM-indicator
    sig-char
    RQ int-array-report
    EOM-indicator
```

Here, the *int-array-report* tells how views are grouped into view display clusters. For the purposes of this report, the clusters are assigned numbers. The first number in the *int-array-report* tells to which cluster, if any, view number one is assigned. Likewise, the second number in the array tells to which cluster view two is assigned, — and so on. If a view has not been assigned to any display cluster, then cluster number zero is reported for that view.

Suppose, for instance, that the signature character for non-GIN reports is the tilde (~), and that the host has issued the character sequence, ~cIQRQ . (This is a REPORT-TERMINAL-SETTINGS command that inquires about the view display cluster settings.) One possible response from the graphics system would be:

```
R~RQspsp6spsp1spsp1spsp1spsp0spsp2cR
```

Here, the tilde (~) is the *sig-char*, the characters RQ signify that the report is for the RQ escape code, and the final c_R is the *EOM-indicator*. The other characters comprise an *int-array-report*, as follows:

```
spsp6 = int-report:6 The array has six items.
spsp1 = int-report:1 View 1 is in display cluster 1.
spsp1 = int-report:1 View 2 is in display cluster 1.
spsp1 = int-report:1 View 3 is in display cluster 1.
spsp0 = int-report:0 View 4 is not in any display cluster.
spsp2 = int-report:2 View 5 is in display cluster 2.
spsp2 = int-report:2 View 6 is in display cluster 2.
```

Thus, the Terminal-Settings-Report tells the host these things:

1. The highest-numbered view that is in a view display cluster is View 6.
2. Views 1, 2, and 3 are in the same display cluster.
3. Views 5 and 6 are in the same display cluster.
4. View 4 is not in any view display cluster.

REPORTLENGTHS

SET-REPORT-LENGTHS

§6 Reports

Sets the length of *int-reports*, *intc-reports*, and *real-reports*.

Syntax

Tek: \textasciixc JG int-array: *report-lengths*

report-lengths (length 1 to 4)

First element: *int-report-length*

Sets precision for *int-reports*.

Second element: *intc-report-length*

Sets precision for *intc-reports*.

Third element: *mantissa-report-length*

Sets precision for the mantissa in *real-reports*.

Fourth element: *exponent-report-length*

Sets precision for the exponent in *real-reports*.

All the element parameters have the same range (zero to six) which specifies the number of bytes sent to the host and therefore, the number of significant bits of precision.

- 0 No change
- 1 Send one byte (4 significant bits plus sign magnitude).
- 2 Send two bytes (10 significant bits plus sign magnitude).
- 3 Send three bytes (16 significant bits plus sign magnitude).
- 4 Send four bytes (22 significant bits plus sign magnitude).
- 5 Send five bytes (28 significant bits plus sign magnitude).
- 6 Send six bytes (34 significant bits plus sign magnitude).

Defaults: After FACTORY = <3,3,3,3>
 Omitted (whole array)= Error JG11 (Level 2)
 Omitted (each element) = 0

RESET RESET

§3 System Initialization

Performs a FACTORY action and loads the settings saved by NVSAVE and SAVEADDRESSES.

Syntax

Tek: \textasciixc KV

Setup: RESET

STI: LLREST

Parameters

None

REVERSE-LINE-FEED

REVERSE-LINE-FEED

§15 Dialog Area

Moves the active position up one line without affecting the character position on the line.

Syntax

VT52: \textasciixc I

Parameters

None

RI *REVERSE-INDEX*

§15 Dialog Area

Moves the active position up one line, without changing the column position.

Syntax

ANSI: **RI** (8D hex) or
 ␣ M (1B, 4D hex)

Setup: None

Parameters

None

RIS *RESET-TO-INITIAL-STATE*

§15 Dialog Area

Restores various screen editing attributes to to their power-up defaults.

Syntax

ANSI: **␣ c**

Setup: None

Parameters

None

RLINELENGTH

SET-REPORT-MAX-LINE-LENGTH

§6 Reports

Sets the maximum line length for report messages and files which the graphics system sends to the host computer.

Syntax

Tek: **␣ IL** int: *max-line-length*

Setup: **RLINELENGTH**
 integer: *max-line-length*

STI: **LLRPM** (*max-line-length*)

Parameters

max-line-length (0 to 65535)

Defaults: After FACTORY = 0
 Omitted = 0

The maximum number of characters per line in reports which the graphics system sends to the host. Setting this parameter to zero disables the maximum-line-length feature.

RM *RESET-MODE**§15 Dialog Area*

Resets various graphics system modes (set with the SM command) that affect alphanumeric display, keyboard function, cursor control, and hardcopy attributes.

Syntax

ANSI: $\text{\%c[Ps: mode [; . . .] I}$

Setup: (See individual *mode* command descriptions.)

Parameters*mode*

Specifies the graphics system mode to be reset:

2	Keyboard Action mode (KAM)
4	Insert/Replace mode (IRM)
12	Send/Receive mode (SRM)
20	Line Feed/New Line mode (LNM)
<1	Overstrike/Replace mode (TEKORM)
<3	Key Expansion mode (TEKKEM)
?1	Cursor Keys mode (TEKCKM)
?2	Ansi to VT52 Mode (TEKANM)
?3	Column mode (TEKCOLM)
?5	Screen mode (TEKSCNM)
?6	Origin mode (TEKOM)
?7	Autowrap mode (TEKAWM)
?8	Autorepeat mode (TEKARM)
?12	Katakana shift mode (TEKKANAM)
?18	Print Form Feed mode (TEKPFF)
?19	Print Extent mode (TEKPEX)
?25	Text Cursor Enable mode (TEKTCM)
?42	National Replacement Character Set mode (TEKNRCM)
?59	Kanji/Katakana Display Mode (TEKKKDM)
?68	Keyboard Usage mode (TEKKBUM)

Defaults: After FACTORY = (see individual *mode* command descriptions)
Omitted or 0 = Error [11]

RSIGCHARS*SET-REPORT-SIGNATURE-CHARACTERS**§6 Reports*

Assigns the "signature characters" that are used within report messages sent to the host computer.

Syntax

Tek: \%cIS int:report-type-code
 int:sig-char
 int:term-sig-char

report-type-code (-3 to -1, or a valid GIN device-function).
Specifies the report type.

Defaults: After FACTORY = 0 for all GIN devices
and reports
Omitted = 0

sig-char (0 to 255)

Specifies the *sig-char* in reports of the specified type. If the *sig-char* is set to \%u (numeric equivalent of zero) then it is omitted from reports sent to the host.

Defaults: After FACTORY = 0 for all GIN devices
and reports
Omitted = 0

term-sig-char (0 to 255)

Specifies the *term-sig-char* in reports of the specified type. If the *term-sig-char* is \%u , then it is omitted in reports sent to the host.

Defaults: After FACTORY = 0 for all GIN devices
and reports
Omitted = 0

SAVE SAVE

§8 File System

Saves an item from the graphics system's internal memory by sending the commands necessary to recreate the item to the specified destination device.

Syntax

Tek: $\text{\textasciitilde{c}JV}$ string: *item-type*
 int: *item-number*
 string: *separator*
 device: *destination*

Setup: SAVE string: *item-type*
 integer: *item-number*
 string: *separator*
 string: *destination*

STI: LLSAVE (*length, item-type, length, item-number,*
 length, separator, length, destination)

Parameters

item-type (length 3)

Specifies the type of item to be saved. Valid values are:

MAC	Macro definition
RAS	Pixels using raster format
RUN	Pixels using runlength format
SEG	Segment definition
ENV	Current graphics system settings
Defaults:	After FACTORY = (none) Omitted = Error JV11 (Level 2)

item-number

Designates the number of the macro, pixels, segments, or graphics system environment to be saved. Valid values depend on the *item-type* (in Setup, **ALL** can be substituted for -1):

For MAC: All values valid for DEFINE (-1 means all)

For RAS and RUN:

-2 to 786432 (1024 x 768)

For SEG: -6, -4, -3, -1, and 1 to 32767

For ENV: -1 to 3

Defaults: After FACTORY = (none)
Omitted = 0 (Error JV21 for SEG)

separator (length 0 or 2)

Specifies the empty string or **TO**.

Defaults: After FACTORY = (none)
Omitted = empty string

destination (length 3)

Designates the device to receive the saved item.

For *item-type* MAC, RAS, RUN, and SEG, the valid destinations are:

HO:, PO:, P1:

For *item-type* ENV, the valid destinations are:

HO:, MO:, . . . , M9:

Defaults: After FACTORY = (none)
Omitted = Error JV41 (Level 2)

SAVEADDRESSES SAVE-ADDRESSES

§9 Host Communications

Saves Internet network address information to nonvolatile memory. Requires LAN option (Option 3H).

Syntax

Tek: See SET-NET-ADDRESSES

Setup: SAVEADDRESSES

STI: See SET-NET-ADDRESSES

Parameters

None

SCREENMODE See TEKSCNM

SD SCROLL-DOWN

§15 Dialog Area

Moves text downward in the dialog viewport.

Syntax

ANSI: Pn Pn: *number-of-lines* T

Setup: None

Parameters*number-of-lines*

Number of lines to be panned.

0 to 32767 Specifies the number of lines

Defaults: After FACTORY = (none)
Omitted or 0 = 1

SDEFINITIONS SET-SURFACE-DEFINITIONS

§13 Colors, Surfaces

Erases the screen and sets the number of bit-planes for each surface.

Syntax

Tek: RD int-array: *surface-defs*

Setup: SDEFINITIONS
integer-array: *surface-defs*

STI: LLDFSF (*length, surface-defs*)

Parameters*surface-defs* (length 1 to 8)

0 to 8 Specifies the number of bit-planes for up to 8 surfaces.

Defaults: After FACTORY = one surface containing all bit-planes from one of the one or two installed frame buffers.

Omitted = Error RD11 (Level 2)

SELECTCHARSET

SELECT-CHARACTER-SET

§14 Text

Designates a character set as the G0, G1, G2, or G3 G-set.

NOTE

This command is syntactically a single command only in Setup. In the host syntaxes, it is a family of ISO 2022 commands that all select a character set. These commands do not have a parameter, but for brevity we are using a parameter in our syntax description here. The right column in this description is not a part of the syntax, but is used to indicate which G-set designation is to be given to the character set.

Syntax

Tek:	Com- mand	Parameter	G-Set Selected
	C}(	dscs: <i>character-set-94</i>	G0
	C)	dscs: <i>character-set-94</i>	G1
	C *	dscs: <i>character-set-94</i>	G2
	C +	dscs: <i>character-set-94</i>	G3
	C -	dscs: <i>character-set-96</i>	G1
	C .	dscs: <i>character-set-96</i>	G2
	C /	dscs: <i>character-set-96</i>	G3

When Sony/Tek Option 4L is installed, the following SELECTCHARSET commands and parameters are available in addition to those shown above:

SYNTAX OPTIONS ADDED BY OPTION 4K

Tek:	Com- mand	Parameter	G-Set Selected
	C \$	dscs: <i>character-set-94x94</i>	G0
	C \$(dscs: <i>character-set-94x94</i>	G0
	C \$(dscs: <i>character-set-94x94</i>	G1
	C \$*	dscs: <i>character-set-94x94</i>	G2
	C \$+	dscs: <i>character-set-94x94</i>	G3
	C +"	dscs: 0 (<i>character-set-94x94</i>)	G3

ANSI: Same as Tek.

Setup: SELECTCHARSET

keyword: *G-set*

delim-string: *character-set-name*

keyword: *character-set-size*

STI: LLSCS (G-set, *character-set-name*,
character-set-size)

Parameters

NOTE

The parameters are described for Setup syntax, with cross-reference to the Tek syntax escape sequences.

G-set

Specifies the G-set designation, with valid values being the four two-character keywords G0, G1, G2 and G3. The G may be lower case.

Defaults: After FACTORY = see SKCS
Omitted = G0

character-set-name (length 1 to 3)

Specifies the character set being designated. Valid values for this dscs parameter depend on the *character-set-size* and are shown in tables at the end of this parameters discussion (where more than one dscs is shown, the first is the current standard designation).

Defaults: After FACTORY = see SKCS
Omitted = (none)

character-set-size

Specifies the number of characters in the set. There are three valid values: 94, 96, and 94x94 (the Tek escape sequences specify this size as indicated by the names of their dscs parameters). The 94 and 96 character sets relate single bytes to particular characters, while the 94x94 character sets relate pairs of bytes to particular characters.

Defaults: After FACTORY = see SKCS
Omitted = 94

REPERTORY OF 94-CHARACTER SETS (values for *character-set-94*)

dscs	Character Set
#1	HP Supplemental
0	DEC Rulings
3	Tek Supplemental
<	DEC Supplemental
=	Swiss-German
>	DEC Technical
A	United Kingdom
B	North American (ASCII graphics)
G	Swedish
H, 7	Swedish Names
I	JIS-Katakana
J	JIS-Roman
K	German
Y	Italian
Z	Spanish
f, R	French
, 6, E	Danish/Norwegian
-	Empty
Other	User defined (see DECDLD)

REPERTORY OF 96-CHARACTER SETS (values for *character-set-96*)

dscs	Character Set
#0	Tektronix 4696 Supplemental
#2	Tektronix ColorQuick Supplemental
A	ASCII Supplemental
F	Greek
-	Empty
Other	User defined (see DECDLD)

REPERTORY OF 94x94-CHARACTER SETS (values for *character-set-94x94*)

dscs	Character Set
B, 0, 1, @	JIS Kanji

SET-4014-ALPHATEXT-SIZE

SET-4014-ALPHATEXT-SIZE

§14 Text

Selects the size of string-precision graphtext and alphatext in the graphics area and/or dialog area.

Syntax

Tek: E_c8 Selects Size 1
 E_c9 Selects Size 2
 $\text{E}_c:$ Selects Size 3
 $\text{E}_c;$ Selects Size 4

Setup: None

STI: LLAS14 (size)

Parameters

size (STI only)

Selects an alphatext size (the number of distinct sizes available depends on ASIZEGROUP command).

0 Selects Size 1
 1 Selects Size 2
 2 Selects Size 3
 3 Selects Size 4

Defaults: After FACTORY = 0
Omitted = 0

SET-4014-LINE-STYLE

SET-4014-LINE-STYLE

§18 Graphics Primitives

Selects a line style for subsequent vectors.

Syntax

Tek: \mathbb{R}_c char: *line-style*

Setup: None

STI: LLLN14 (*line-style*)

Parameters

line-style

Specifies the line style for vectors displayed on the screen.

` to o Specifies a line style; the line styles designated by characters ` to o (ADE 96 to ADE 111) are shown in the table.

Defaults: After FACTORY = ` (ADE 96)
Omitted = (none)

SET-ALPHATEXT-FONT

SET-ALPHATEXT-FONT

§14 Text

Invokes either the G0 or G1 character set into Graphics Left.

Syntax

Tek: $\mathbb{R}_c s_1$ (invokes G0 set)
 $\mathbb{R}_c s_0$ (invokes G1 set)

ANSI: s_1 (invokes G0 set)
 s_0 (invokes G1 set)

Setup: None

STI: LLAFont (*font*)

NOTE

The ANSI syntax shown for this command is that for the LS0 and LS1 commands, two ISO 2022 controls for invoking G0 and G1 character sets into Graphics Left.

Parameters

font (STI only)

0 Invokes G0 set

1 Invokes G1 set

Defaults: After FACTORY = 0
Omitted = 0

SET-NET-ADDRESSES

SET-NET-ADDRESSES

§9 Host Communications

Performs operations on the net address table. Requires LAN option (Option 3H).

Syntax

Tek: $\mathbb{R}_c OX$ int: *operation*
 int: *add-flag*
 char-array: *string-1*
 char-array: *string-2*
 char-array: *string-3*

Setup: See IBROADCAST, IGATEADDRESS, IHOSTADDRESS, ILANADDRESS, ITERMADDRESS, LOADADDRESSES, SAVEADDRESSES

STI: LLNADD (*operation, add-flag, length, string-1, length, string-2, length, string-3*)

Parameters

operation

Specifies the net address operation:

- 0 ITERMADDRESS
- 1 IHOSTADDRESS
- 2 ILANADDRESS
- 3 IGATEADDRESS
- 4 SAVEADDRESSES
- 5 LOADADDRESSES
- 6 IBROADCAST

Defaults: After FACTORY = (none)
Omitted = 0

add-flag

Valid settings depend on the operation. See each command description for details. If the parameter is not used, any syntactically proper *int* may be given.

Defaults: After FACTORY = See each command
Omitted = See each command

string-1

Valid length, meaning, and content depend on the operation. See each command description for details. If the parameter is not used, any syntactically proper *char-array* may be given.

Defaults: After FACTORY = See each command
Omitted = See each command

Command Summary

string-2

Valid length, meaning, and content depend on the operation. See each command description for details. If the parameter is not used, any syntactically proper *char-array* may be given.

Defaults: After FACTORY = See each command
Omitted = See each command

string-3

Valid length, meaning, and content depend on the operation. See each command description for details. If the parameter is not used, any syntactically proper *char-array* may be given.

Defaults: After FACTORY = See each command
Omitted = See each command

SET-TELNET-ATTRIBUTES

SET-TELNET-ATTRIBUTES

§9 Host Communications

Specifies the Telnet escape character, ASCII or binary mode, local mode, passthru mode, and Network Virtual Terminal end-of-line character for Telnet communications. Requires LAN option (Option 3H).

Syntax

Tek: %cOV int: *attribute*
 device: *logical-device*
 int: *entry*

Setup: See TDATA, TESCAPE, TLOCAL, and TPASSTHRU

STI: LLNATT (*attribute, length, logical-device, entry*)

Parameters

attribute

Specifies the Telnet communications attribute that is to be set.

- | | |
|-----------|--|
| 0 | Selects Telnet "escape to local" character |
| 1 | Selects ASCII or binary data type |
| 2 | Enables or disables Telnet Local mode |
| 3 | Enables or disables Telnet Passthru mode |
| 4 | Selects the Network Virtual Terminal (NVT) end-of-line character |
| Defaults: | After FACTORY = (none)
Omitted = Error OV11 |

logical-device

The logical device to which this command applies.

HO: The host port.

Defaults: After FACTORY = (none)
Omitted = (none)

entry

The content and valid values for this parameter depend on the *attribute* parameter specified (only valid when *attribute* is 0, 1, 3 or 4; otherwise, not used). Valid values are:

Attribute 0:

escape-character

Specifies the ADE value of the character to be used as the Telnet "escape to local" character. Valid values are 0 through 255.

Defaults: After FACTORY = 29
Omitted = No change

Attribute 1:

data-type

Specifies the data type. Valid entries are:

- | | |
|---|-------------|
| 0 | ASCII data |
| 1 | Binary data |

Defaults: After FACTORY = 0
Omitted = (none)

Attribute 3:

passthru-mode

Specifies the Telnet passthru mode. Valid entries are:

- | | |
|---|-------------------------|
| 0 | Turns Passthru mode off |
| 1 | Turns Passthru mode on |
| 2 | Toggles Passthru mode |

Defaults: After FACTORY = 0
Omitted = 0

Attribute 4:

NVT-end-of-line-character

Specifies the Network Virtual Terminal end-of-line character (applies only in ASCII mode). Valid entries are:

- | | |
|---|---|
| 0 | Selects $\backslash u$ as the character to follow c_R |
| 1 | Selects $\backslash f$ as the character to follow c_R |

Defaults: After FACTORY = 0
Omitted = 0

SGCALL CALL-SEGMENT

§19 Segments

Causes the specified segment's image to be scaled and rotated by the concatenation of transforms and then displayed at a specified position.

Syntax

Tek:	ꞞcSF	int: <i>segment-number</i> xy+: <i>position</i> int: <i>attributes-flag</i>
Setup:	SGCALL	integer: <i>segment-number</i> xy+: <i>position</i> keyword: <i>attributes-flag</i>
STI:	LLCASG	(<i>segment-number, position [x,y], attributes</i>)
	LLCAS4	(<i>segment-number, position [x,y], attributes</i>)

Parameters

segment-number

Specifies the segment to be called.

- 3 All segments that match the current matching class.

-1 All segments.

1 to 32767 The specific segment.

Defaults: After FACTORY = (none)
Omitted = Error SF11

position

Position of the called segment. The range of valid values for x and y is -2^{31} to $2^{31}-1$.

Defaults: After FACTORY = (none)
Omitted = 0, 0

attributes-flag

The two low bits of this integer parameter are two separate flag bits that control primitive attribute settings. Bit 0 controls saving and restoring primitive attributes. Bit 1 controls primitive attribute default setting.

0 Save primitive attributes before calling segment and restore the saved attributes when segment subroutine returns. Do not reset graphics system attributes to default values (Setup: **NONE**).

1 Graphics System attributes changed by the called segment remain in effect when the segment subroutine returns. Do not reset graphics system attributes to default values (Setup: **MODIFY**).

2 Save graphics system attributes before calling segment and restore the saved attributes when segment subroutine returns. Reset graphics system attributes to default values when the segment is called (Setup: **RESET**).

3 Graphics System attributes changed by the called segment remain in effect when the segment subroutine returns. Reset graphics system attributes to default values when the subroutine segment is called (Setup: **BOTH**).

Defaults: After FACTORY = 0
Omitted = 0

SGCLASS SET-SEGMENT-CLASS

§19 Segments

Changes the set of classes that are assigned to a segment for use in segment matching operations.

Syntax

Tek: \mathbb{R}_c SA int: *segment-number*
 int-array: *removal-array*
 int-array: *addition-array*

Setup: SGCLASS integer: *segment-number*
 integer-array: *removal-array*
 integer-array: *addition-array*

STI: LLCSSG (*segment-number, length, removal-array,*
 length, addition-array)

Parameters

segment-number

Names the segment whose classes are being altered.

- 3 All segments that match the current matching class.
- 2 Future segments.
- 1 All segments.
- 1 to 32767 A specific segment.
- Defaults: After FACTORY = (none)
 Omitted = Error SA11

removal-array (length 0 to 32768)

Lists the segment classes that are being removed from the specified segment. Valid elements are:

- 1 All classes.
- 1 to 64 A specific class.
- Defaults: After FACTORY = empty array for Segment -2
 Omitted = empty array

addition-array (length 0 to 32768)

Lists the segment classes that are being added to the specified segment. Valid elements are:

- 1 All classes.
- 1 to 64 A specific class.
- Defaults: After FACTORY = empty array for Segment -2
 Omitted = empty array

SGCLOSE END-SEGMENT

§19 Segments

Terminates segment and panel definitions if a panel is currently open within the segment.

Syntax

Tek: \mathbb{R}_c SC

Setup: SGCLOSE

STI: LLCLSG

Parameters

None

SGDELETE DELETE-SEGMENT

§19 Segments

Removes the specified segment from memory.

Syntax

Tek: \mathbb{R}_c SK int: *segment-number*

Setup: SGDELETE integer: *segment-number*

STI: LLDL SG (*segment-number*)

Parameters

segment-number

The number of the segment to be deleted.

- 3 All segments that match the current matching class.
- 1 All segments.
- 1 to 32767 A specific segment.
- Defaults: After FACTORY = (none)
 Omitted = Error SK11

SGDETECT *SET-SEGMENT-DETECTABILITY**§19 Segments*

Sets the detectability of a segment for GIN pick functions.

Syntax

Tek: [®]cSD int: *segment-number*
 int: *detectability*

Setup: SGDETECT integer: *segment-number*
 keyword: *detectability*

STI: LLDTSG (*segment-number, detectability*)

Parameters*segment-number*

Names the segment whose detectability mode is being set.

- 3 All segments that match the current matching class.
- 2 Future segments.
- 1 All segments.
- 0 The crosshair cursor.
- 1 to 32767 A specific segment.
- Defaults: After FACTORY = (none)
 Omitted = 0

detectability

Specifies whether a segment can be picked in a GIN pick operation or not.

- 0 Can't be picked (Setup: **NO**).
- 1 Can be picked (Setup: **YES**).
- Defaults: After FACTORY = 1 for Segment -2
 Omitted = 0

SGDOWN *BEGIN-LOWER-SEGMENT**§19 Segments*

Ends the current segment definition and begins a new segment definition with a segment number the next lower sequential number.

Syntax

Tek: [®]cSB

Setup: SGDOWN

STI: LLBLSG

Parameters

None

SGEDIT *SET-SEGMENT-EDIT-MODE**§19 Segments*

Determines the position and status of primitive attributes of the trailing portion of a segment when it is closed and redisplayed, after it was reopened by a SGREMOVE, SGINSERT, or SGREPLACE command.

Syntax

Tek: [®]cUH int: *edit-mode*

Setup: SGEDIT keyword: *edit-mode*

STI: LLEMSG (*edit-mode*)

Parameters*edit-mode*

The two low bits of this int parameter are two separate flags that control the appearance of the trailing part of an edited segment. Bit 0 controls xy translation (for 2-D segments) and bit 1 controls primitive attributes.

- 0 Do not translate; restore primitive attributes (Setup: **NONE**).
- 1 Translate; restore primitive attributes (Setup: **POSITION**).
- 2 Do not translate; do not restore primitive attributes (Setup: **ATTRIBUTE**).
- 3 Translate; do not restore primitive attributes (Setup: **Both**).
- Defaults: After FACTORY = 0
 Omitted = 0

SGHIGHLIGHT

SET-SEGMENT-HIGHLIGHTING

§19 Segments

Sets a segment's highlight attribute.

Syntax

Tek: $\text{\textasciitilde{c}}\text{SH}$ int: *segment-number*
 int: *highlighting*

Setup: **SGHIGHLIGHT** integer: *segment-number*
 keyword: *highlighting*

STI: **LLHISG** (*segment-number, highlighting*)

Parameters

segment-number

Names the segment for which highlighting is being specified.

- 3 All segments that match the current matching class.
- 2 Future segments.
- 1 All segments.
- 1 to 32767 A specific segment.
- Defaults: After FACTORY = (none)
 Omitted = Error SH11

highlighting

Specifies how a segment is highlighted.

- 0 Blinking and outlining are off (Setup: **NO**).
- 1 Blinking is on and outlining is not changed (Setup: **YES**).
- Defaults: After FACTORY = 0 (for *segment-number* -2)
 Omitted = 0

SGINCLUDE

INCLUDE-COPY-OF-SEGMENT

§19 Segments

Causes the specified segment to be included within the currently open segment.

Syntax

Tek: $\text{\textasciitilde{c}}\text{LK}$ int: *segment-number*

Setup: **SGINCLUDE** integer: *segment-number*

STI: **LLINSg** (*segment-number*)

Parameters

segment-number

Specifies the segment to be included.

- 3 All existing segments that match the current matching class.
- 1 All existing segments.
- 1 to 32767 The specified segment.
- Defaults: After FACTORY = (none)
 Omitted = Error LK11

SGINSERT *INSERT-INTO-SEGMENT**§19 Segments*

Reopens an existing segment to allow insertion of new primitives and primitive attributes.

Syntax

Tek: \%cUI int: *segment-number*
 int: *pick-ID-group*
 int: *before-or-after*

Setup: **SGINSERT** integer: *segment-number*
 integer: *pick-ID-group*
 keyword: *before-or-after*

STI: **LLHSG** (*segment-number, pick-ID-number,*
 before-or-after)

Parameters*segment-number*

Segment to which primitives and primitive attributes will be added. Valid range is 1 to MAXSEG.

Defaults: After FACTORY = (none)
 Omitted = Error UI11

pick-ID-group

Specifies the position in the segment at which additional primitives and primitive attributes will be added.

-1 The segment end.
 1 The segment beginning.
 2 to 32767 A particular Pick ID group.

Defaults: After FACTORY = (none)
 Omitted = Error UI21

before-or-after

Specifies where insertion occurs.

0 Before Pick ID group (Setup: **BEFORE**).
 1 After Pick ID group (Setup: **END**).
 2 Just after the Pick ID that starts this Pick ID group (Setup: **AFTER**).

Defaults: After FACTORY = 0
 Omitted = 0

SGMATCHINGCLASS*SET-CURRENT-MATCHING-CLASS**§19 Segments*

Establishes the inclusion and exclusion sets used in matching operations.

Syntax

Tek: \%cSL int-array: *inclusion-set*
 int-array: *exclusion-set*

Setup: **SGMATCHINGCLASS** integer-array: *inclusion-set*
 integer-array: *exclusion-set*

STI: **LLMTCL** (*length, inclusion-set,*
 length, exclusion-set)

Parameters*inclusion-set* (array length 0 to 32768)

The set of classes used in the inclusion part of a matching operation. Valid elements are:

-1 All classes.
 1 to 64 A specific class.

Defaults: After FACTORY = empty array
 Omitted = empty array

exclusion-set (array length 0 to 32768)

The set of classes used in the exclusion part of a matching operation. Valid elements are:

-1 All classes.
 1 to 64 A specific class.

Defaults: After FACTORY = empty array
 Omitted = empty array

SGMODE *SET-SEGMENT-WRITING-MODE*

§19 Segments

Specifies the writing mode attribute for the specified segment.

Syntax

Tek: \mathbb{E}_c SM int: *segment-number*
 int: *writing-mode*

Setup: SGMODE integer: *segment-number*
 keyword: *writing-mode*

STI: LLWMSG (*segment-number, writing-mode*)

Parameters

segment-number

Names the segment for which a writing mode is being specified.

- 3 All segments that match the current matching class.
- 2 Future segments.
- 1 All segments.
- 0 The crosshair cursor.
- 1 to 32767 A specific segment.

Defaults: After FACTORY = (none)
 Omitted = 0

writing-mode

Specifies the current writing mode.

- 1 Set mode (Setup: **SET**).
 - 2 XOR mode (Setup: **XOR**).
 - 3 AND mode (Setup: **AND**).
 - 4 OR mode (Setup: **OR**).
- Defaults: After FACTORY = 1 for segment -2
 Omitted = Error SM21

SGNEW *BEGIN-NEW-SEGMENT*

§19 Segments

Begins the definition of a new graphic segment with the specified segment identification number and closes the currently open segment, if there is one.

Syntax

Tek: \mathbb{E}_c SE int: *segment-number*

Setup: SGNEW integer: *segment-number*

STI: LLBNSG (*segment-number*)

Parameters

segment-number

The number of the segment being defined. Valid range is 1 to 32767.

Defaults: After FACTORY = (none)
 Omitted = Error SE11

SGOPEN *BEGIN-SEGMENT*

§19 Segments

Begins a segment definition.

Syntax

Tek: \mathbb{E}_c SO int: *segment-number*

Setup: SGOPEN integer: *segment-number*

STI: LLOPSG (*segment-number*)

Parameters

segment-number

Number of segment to be defined. Valid range is 1 to 32767.

Defaults: After FACTORY = (none)
 Omitted = error SO11

SGPICKID *SET-PICK-ID**§19 Segments*

Inserts a Pick ID into the segment being defined.

Syntax

Tek: **%cMI** int: *pick-ID-number*
 Setup: **SGPICKID** integer: *pick-ID-number*
 STI: **LLPKID** (*pick-ID-number*)

Parameters*pick-ID-number*

Specifies the *pick-ID* for parts of the currently open segment. Valid range is 0 to $2^{31}-1$.

Defaults: After FACTORY = 0
 Omitted = 0

SGPIVOT *SET-PIVOT-POINT**§19 Segments*

Sets the pivot point for subsequent graphtext definitions, and segments. It also sets the position of future segments (Segment -2).

Syntax

Tek: **%cSP** xy+: *pivot-point*
 Setup: **SGPIVOT** xy+: *pivot-point*
 STI: **LLPVSG** (*pivot-point [x,y]*)
 LLPVS4 (*pivot-point [x,y]*)

Parameters*pivot-point*

Specifies the pivot point of subsequent segment definitions and graphtext character definitions. The range of valid values

Defaults: After FACTORY = (0,0) Coordinate mode 1.
 Omitted = (0,0) Coordinate mode 1.

SGPOSITION *SET-SEGMENT-POSITION**§19 Segments*

Moves a segment's pivot point to a world space location.

Syntax

Tek: **%cSX** int: *segment-number*
 xy+: *position*
 Setup: **SGPOSITION** integer: *segment-number*
 xy+: *position*
 STI: **LLTNSG** (*segment-number, position [x,y]*)
 LLTNS4 (*segment-number, position [x,y]*)

Parameters*segment-number*

Specifies the segment whose position is being set.

-3 All segments that match the current matching class
 -2 Future segments
 -1 All defined segments
 0 The crosshair GIN cursor
 1 to 32767 A specific segment
 Defaults: After FACTORY = (none)
 Omitted = 0

position

Specifies the world space position. The range of valid values for x and y is -2^{31} to $2^{31}-1$.

Defaults: After FACTORY = (0,0) for segment -2
 Omitted = (0,0)

SGPRIORITY
*SET-SEGMENT-DISPLAY-PRIORITY**§19 Segments*

Sets display priority of the specified segment.

Syntax

Tek: **%cSS** int: *segment-number*
 int: *priority-number*
 Setup: **SGPRIORITY** integer: *segment-number*
 integer: *priority-number*
 STI: **LLPRSG** (*segment-number, priority-number*)

Parameters

segment-number

Specifies the segment for which a display priority is being set.

- 3 All segments that match the current matching class.
- 2 The future segment.
- 1 All segments.
- 1 to 32767 A specific segment.
- Defaults: After FACTORY = (none)
Omitted = Error SS11

priority-number

Specifies the display priority of the specified segment. Valid range is -32768 to 32767.

- Defaults: After FACTORY = 0 for segment -2
Omitted = 0

SGR *SELECT-GRAPHIC-RENDITION*

§15 Dialog Area

Specifies display attributes for alphanumerics in the active dialog area.

Syntax

ANSI: %c[Ps: *text-rendition* [; . . .] m

Setup: TEXTRENDITION
integer-array: *text-rendition*

Parameters

text-rendition

Specifies display attributes for alphanumerics in the active dialog area. Values that start with <, =, or > are not allowed in Setup.

- 0 Default attributes: No bold, no blink, no underscore, positive image (that is, foreground and background indices *not* reversed), and dialog indices as set by the most recent DAINDEX command; cancels the effect of any previous SGR parameters of 1, 4, 5, 7, 30 to 37, 39, 40 to 47, or 49.
- 1 Alternate character foreground index (bold)
- 4 Underscore
- 5 Blink
- 7 Reverse video (interchanges character foreground and background indices)
- 22 Normal character foreground (cancels *text-rendition* 1)

- 24 No underscore (cancels *text-rendition* 4)
- 25 No blink (cancels *text-rendition* 5)
- 27 Positive video (cancels *text-rendition* 7)
- 30 Selects Index 0 (default: black) for character foreground
- 31 Selects Index 2 (default: red) for character foreground
- 32 Selects Index 3 (default: green) for character foreground
- 33 Selects Index 7 (default: yellow) for character foreground
- 34 Selects Index 4 (default: blue) for character foreground
- 35 Selects Index 6 (default: magenta) for character foreground
- 36 Selects Index 5 (default: cyan) for character foreground
- 37 Selects Index 1 (default: white) for character foreground
- 39 Selects default index (Index 1) for character foreground
- 40 Selects Index 0 (default: transparent) for character background
- 41 Selects Index 2 (default: red) for character background
- 42 Selects Index 3 (default: green) for character background
- 43 Selects Index 7 (default: yellow) for character background
- 44 Selects Index 4 (default: blue) for character background
- 45 Selects Index 6 (default: magenta) for character background
- 46 Selects Index 5 (default: cyan) for character background
- 47 Selects Index 1 (default: white) for character background
- 49 Selects default index (Index 0) for character background
- <n Selects Index *n* for character foreground; *n* must be in the range 0 through 255.
- =n Selects Index *n* for character background; *n* must be in the range 0 through 255.
- >n Selects Index *n* for dialog area background (wipe index); *n* must be in the range 0 through 255.
- Defaults: After FACTORY = 0
Omitted = 0

SGREMOVE *DELETE-PART-OF-SEGMENT**§19 Segments*

Deletes Pick ID groups from the specified segment.

Syntax

Tek: E_cUD int: *segment-number*
 int: *pick-ID-first*
 int: *pick-ID-last*

Setup: **SGREMOVE** integer: *segment-number*
 integer: *pick-ID-first*
 integer: *pick-ID-last*

STI: **LLDPSG** (*segment-number, pick-ID-first, pick-ID-last*)

Parameters*segment-number*

Segment number from which primitives and primitive attributes are to be deleted. Valid range is 1 to MAXSEG.

Defaults: After FACTORY = (none)
 Omitted = Error UD11

pick-ID-first

The first Pick ID group to be deleted.

-1 The segment end.
 1 The segment beginning.
 2 to 32767 A particular Pick ID group.

Defaults: After FACTORY = (none)
 Omitted = Error UD21

pick-ID-last

The last Pick ID group to be deleted.

-1 The segment end.
 1 The segment beginning.
 2 to 32767 A particular Pick ID group.

Defaults: After FACTORY = (none)
 Omitted = Error UD31

SGRENAME *RENAME-SEGMENT**§19 Segments*

Renames an existing segment.

Syntax

Tek: E_cSR int: *old-segment-number*
 int: *new-segment-number*

Setup: **SGRENAME** integer: *old-segment-number*
 integer: *new-segment-number*

STI: **LLRNSG** (*old-segment-number, new-segment-number*)

Parameters*old-segment-number*

Number of the segment being renamed. Valid range is 1 to 32767.

Defaults: After FACTORY = (none)
 Omitted = Error SR11

new-segment-number

New number for the segment. Valid range is 1 to 32767.

Defaults: After FACTORY = (none)
 Omitted = Error SR 21

SGREPLACE REPLACE-PART-OF-SEGMENT

§19 Segments

Deletes Pick ID groups from the segment and leaves it open.

Syntax

Tek: $\text{\textcircled{R}}_c\text{UE}$ int: *segment-number*
 int: *pick-ID-first*
 int: *pick-ID-last*

Setup: SGREPLACE integer: *segment-number*
 integer: *pick-ID-first*
 integer: *pick-ID-last*

STI: LLRESG (*segment-number, pick-ID-first, pick-ID-last*)

Parameters

segment-number

Segment in which primitives and primitive attributes will be replaced. Valid range is 1 to MAXSEG.

Defaults: After FACTORY = (none)
 Omitted = Error UE11

pick-ID-first

The Pick ID group at which replacement will begin.

-1 The segment end.
 1 The segment beginning.
 2 to 32767 A particular Pick ID group.
 Defaults: After FACTORY = (none)
 Omitted = Error UE21

pick-ID-last

The Pick ID group after which replacement ends.

-1 The segment end.
 1 The segment beginning.
 2 to 32767 A particular Pick ID group.
 Defaults: After FACTORY = (none)
 Omitted = Error UE31

SGSCALEROTATE SET-SEGMENT-SCALE-ROTATION

§19 Segments

Sets a scale and rotation modeling transform for a 2-D segment.

Syntax

Tek: $\text{\textcircled{R}}_c\text{SJ}$ int: *segment-number*
 real: *x-scale-factor*
 real: *y-scale-factor*
 real: *rotation-angle*

Setup: SGSCALEROTATE integer: *segment-number*
 real: *x-scale-factor*
 real: *y-scale-factor*
 real: *rotation-angle*

STI: LLSRSG (*segment-number, x-scale-factor, y-scale-factor, rotation-angle*)

Parameters

segment-number

Names the segment to be scaled and/or rotated.

-5 Future called 2-D segment.
 -3 All 2-D segments that match the current matching class.
 -2 Future 2-D segments.
 -1 All 2-D segments.
 1 to 32767 The specific 2-D segments
 Defaults: After FACTORY = (none)
 Omitted = error SJ11

x-scale-factor

The factor to scale the segment in the X-direction. Valid range is any legal real.

Defaults: After FACTORY = 1.0
 Omitted = 0.0

y-scale-factor

The factor to scale the segment in the Y-direction. Valid range is any legal real.

Defaults: After FACTORY = 1.0
 Omitted = 0.0

rotation-angle

The counter-clockwise rotation angle in degrees. A negative number specifies clockwise rotation. Valid range is -32767.0 to 32767.0.

Defaults: After FACTORY = 0.0
Omitted = 0.0

SGTRANSFORM*SET-SEGMENT-IMAGE-TRANSFORM**§19 Segments*

Transforms 2-D segments.

Syntax

Tek: \%cSI int: *segment-number*
 real: *x-scale-factor*
 real: *y-scale-factor*
 real: *rotation-angle*
 xy: *position*

Setup: SGTRANSFORM integer: *segment-number*
 real: *x-scale-factor*
 real: *y-scale-factor*
 real: *rotation-angle*
 xy: *position*

STI: LLIMSG (*segment-number, x-scale-factor, y-scale-factor, angle, rotation-angle, position [x,y]*)

 LLIMS4 (*segment-number, x-scale-factor, y-scale-factor, angle, rotation-angle, position [x,y]*)

Parameters*segment-number*

Names the segment for which an image transform is being specified.

-3 all 2-D segments that match the current matching class

-2 the future 2-D segment

-1 all 2-D segments

1 to 32767 a specific segment

Defaults: After FACTORY = none
Omitted = error S11

x-scale-factor

The factor by which the segment is scaled in the x-direction. Valid range is any legal real.

Defaults: After FACTORY = 1.0, segment -2
Omitted = 0.0

y-scale-factor

The factor by which the segment is scaled in the y-direction. Valid range is any legal real.

Defaults: After FACTORY = 1.0, Segment -2
Omitted = 0.0

rotation-angle

The counterclockwise rotation angle, in degrees. Valid range is -32767.0 to 32767.0. (A negative number specifies a clockwise rotation.)

Defaults: After FACTORY = 0.0, Segment -2
Omitted = 0.0

position

Specifies where in world space the segment's pivot point is located. The range of valid values for *x* and *y* is -2^{31} to $2^{31} - 1$.

Defaults: After FACTORY = 0,0; segment -2
Omitted = 0,0

SGUP *BEGIN-HIGHER-SEGMENT**§19 Segments*

Ends the definition of the segment currently being defined, and begins the definition of a segment with a number (segment ID) one greater than that of the segment just ended.

Syntax

Tek: \%cSN

Setup: SGUP

STI: LLBHSG

Parameters

None

SGVISIBILITY SET-SEGMENT-VISIBILITY*§19 Segments*

Make the segment visible or invisible.

Syntax

Tek: \%cSV int: *segment-number*
 int: *visibility*

Setup: **SGVISIBILITY** integer: *segment-number*
 keyword: *visibility*

STI: **LLVISG** (*segment-number, visibility*)

Parameters*segment-number*

Names the segment whose visibility is being specified.

–3 All segments that match the current matching class.

–2 Future segments.

–1 All segments.

0 The crosshair cursor.

1 to 32767 A specific segment.

Defaults: After FACTORY = (none)
 Omitted = 0

visibility

Specifies whether a segment is visible in the current view.

0 Makes segment invisible (Setup: **NO**).

1 Makes segment visible (Setup: **YES**).

Defaults: After FACTORY = 1 for segment –2
 Omitted = 0

SKCS SELECT-KEYBOARD-CHARACTER-SET*§10 Keyboards*

Selects the National, ASCII Multinational, or DEC Multinational keyboard character set.

Syntax

Tek: \%c\#\&0 Selects the National keyboard character set

\%c\#\&1 Selects the ASCII Multinational keyboard character set

\%c\#\&2 Selects the DEC Multinational keyboard character set

ANSI: Same as Tek.

Setup: **KBDCHARSET** keyword: *keyboard-character-set*

STI: **LLSKCS** (*keyboard-character-set*)

Parameters*keyboard-character-set* (Setup and STI)

0 Selects the National keyboard character set (Setup: **NATIONAL**)

1 Selects the ASCII Multinational keyboard character set (Setup: **ASCII MULTINATIONAL**)

2 Selects the DEC Multinational keyboard character set (Setup: **DECMULTINATIONAL**)

Defaults: After FACTORY = 0
 Omitted = 0

SL SCROLL-LEFT*§15 Dialog Area*

Moves text to the left in the active dialog viewport.

Syntax

ANSI: $\text{\%c[Pn: number-of-columns \> @}$

Setup: None

Parameters*number-of-columns*

Number of columns to be scrolled.

0 to 32767 Specifies the number of columns

Defaults: After FACTORY = (none)
 Omitted or 0 = 1

SM SET-MODE

§15 Dialog Area

Sets various graphics system modes, which affect alphanumeric display, keyboard function, cursor control, and hardcopy attributes (modes set with this command can be reset with the RM command).

Syntax

ANSI: $\text{\%c[Ps: mode [: . .] h}$

Setup: (See individual *mode* command descriptions.)

Parameters*mode*

Specifies the graphics system mode to be set:

2	Keyboard Action mode (KAM)
4	Insert/Replace mode (IRM)
12	Send/Receive mode (SRM)
20	Line Feed/New Line mode (LNM)
<1	Overstrike/Replace mode (TEKORM)
<3	Key Expansion mode (TEKKEM)
?1	Cursor Keys mode (TEKCKM)
?2	Ansi to VT52 Mode (TEKANM)
?3	Column mode (TEKCOLM)
?5	Screen mode (TEKSCNM)
?6	Origin mode (TEKOM)
?7	Autowrap mode (TEKAWM)
?8	Autorepeat mode (TEKARM)
?12	Katakana shift mode (TEKKANAM)
?18	Print Form Feed mode (TEKPFF)
?19	Print Extent mode (TEKPEX)
?25	Text Cursor Enable mode (TEKTCEM)
?42	National Replacement Character Set mode (TEKNRCM)
?59	Kanji/Katakana Display mode (TEKKKDM)
?68	Keyboard Usage mode (TEKKBUM)

Defaults: After FACTORY = (see individual *mode* command descriptions)
Omitted or 0 = Error [h11]

SNOOPY SET-SNOOPY-MODE

§5 Programming Services

This command enables and disables Snoopy mode.

Syntax

Tek: \%cKS int: *Snoopy-mode*
Setup: SNOOPY keyword: *Snoopy-mode*
STI: LLSNPY (*Snoopy-mode*)

Parameters*Snoopy-mode*

Specifies the snoopy mode.

0	Removes the graphics system from Snoopy mode (Setup: NO).
1	Places the graphics system in Snoopy mode 1 (Setup: YES).
2	Places the graphics system in Snoopy mode 2 (Setup: ON).

Defaults: After FACTORY = 0
Omitted = 1

SPRIORITIES SET-SURFACE-PRIORITIES

§13 Colors, Surfaces

Determines which of the opaque writing surfaces are "in front" of others and which are "behind" other surfaces.

Syntax

Tek: \textasciix1BcRN int-array: *priorities*
 Setup: SPRIORITIES integer-array: *priorities*
 STI: LLPRSF (*length, priorities*)

Parameters

priorities (length 2 to 32768, even)

Specifies the surface number and priority number for that surface.

first element: *surface-number*

1 to 8 Surface number

Defaults: After FACTORY = 1
 Omitted = Error RN11 (Level 2)

second element: *priority-number*

0 to 9 Priority numbers (lowest number = highest priority)

Defaults: After FACTORY = 1
 Omitted = Error RN11 (Level 2)

SR SCROLL-RIGHT

§15 Dialog Area

Moves text to the right in the dialog viewport.

Syntax

ANSI: $\text{\textasciix1Bc[Pn: number-of-columns \text{\textasciix1B} A}$
 Setup: None

Parameters

number-of-columns

Number of columns to be scrolled.

0 to 32767 Specifies the number of columns.

Defaults: After FACTORY = (none)
 Omitted or 0 = 1

SRM SEND/RECEIVE-MODE

§9 Host Communications

Controls local echo of typed characters.

Syntax

ANSI: $\text{\textasciix1Bc[12l}$ (Reset: Local echo enabled)
 $\text{\textasciix1Bc[12h}$ (Set: Local echo disabled)
 Setup: See ECHO

Parameters

None

SS2 SINGLE-SHIFT-TWO

§14 Text

Invokes the G2 character set into Graphics Left for the next single graphics character in the active dialog area.

Syntax

ANSI: SS2 (8E hex) or
 \textasciix1Bc N

Setup: None

Parameters

None

SS3 SINGLE-SHIFT-THREE

§14 Text

Invokes the G3 character set into Graphics Left for the next single displayable character in the active dialog area.

Syntax

ANSI: SS3 (8F hex) or
 \textasciix1Bc O

Setup: None

Parameters

None

ST *STRING-TERMINATOR*

§4 Command Syntax

Terminates a control string opened by the APC, DCS, OSC or PM character.

Syntax

ANSI: ST (9C hex) or
 $\text{\textasciix{27}}$ c\ (1B,5C hex)

Setup: None

Parameters

None

STATUS *STATUS*

§5 Programming Services

Generates a list of current parameter values for Setup commands.

Syntax

Setup: STATUS string: *command-name, command-cluster, or escape-sequence*

Parameters*command-name*

This is the Setup name of a command, or a special inquiry name for certain system settings. The Setup and special inquiry names may be entered in upper, lower, or mixed case characters, and may be abbreviated to as few characters as are necessary to make them unique. The special inquiry names (with the inquiry code, if any, for REPORT-TERMINAL-SETTINGS in parentheses) are:

```
VERSION (00)
GVERSION (none)
LEVEL (99)
GLEVEL (none)
AMEMORYBLOCKS (?A)
BUFFERS (?B)
MEMORYBLOCKS (?M)
PMEMORYBLOCKS (?P)
GMEMORYBYTES (none)
SCREENSIZE (?R)
TERMINAL (?T)
```

escape-sequence This is the $\text{\textasciix{27}}$ c character, followed by a two-opcode Tek command or special inquiry code for the REPORT-TERMINAL-SETTINGS command.

command-cluster This is a *command-cluster*, which is functional grouping of commands. As with the *Setup-command-name*, the *command-cluster* may be entered in upper or lower or mixed case characters, and may be abbreviated. If no *command-cluster* is given, all are listed.

The cluster names are:

```
ANSI
COAX (coax option)
COMMUNICATIONS
DIALOG
GENERAL
GRAPHICS
HARDCOPY
KEYBOARD
PIXELS
2PPI
REPORT/INPUT
SEGMENTS
SURFACES
VIEWS
```

Defaults: After FACTORY = (none)
 Omitted = complete list

STOPBITS *SET-STOP-BITS*

§9 Host Communications

Specifies the number of stop bits per character transmitted to the host.

Syntax

Tek: $\text{\textasciix{27}}$ cNB int: *number-of-stop-bits*
 Setup: STOPBITS integer: *number-of-stop-bits*
 STI: LLSTBT (*number-of-stop-bits*)

Parameters*number-of-stop-bits*

Specifies the number of stop bits per character transmitted from the host port. Valid values are:

```
1            One stop bit
2            Two stop bits
```

Defaults: After FACTORY = 1
 Omitted = error NB11 (Level 2)

SU SCROLL-UP

§15 Dialog Area

Moves text upward in the dialog viewport.

Syntax

ANSI: $\text{\%c[Pn: number-of-lines S}$

Setup: None

Parameters

number-of-lines

Number of lines to be scrolled.

0 to 32767 Specifies the number of lines

Defaults: After FACTORY = (none)
Omitted or 0 = 1

SUB SUBSTITUTE

§4 Command Syntax

SUB is a ANSI mode command terminator that terminates control sequences, escape sequences, and control strings.

Syntax

ANSI: \%b (1A hex)

Setup: None

Parameters

None

SVISIBILITY SET-SURFACE-VISIBILITY

§13 Colors, Surfaces

Changes the visibility of one or more surfaces without affecting surface priorities or the visibility attributes of any segments on a surface.

Syntax

Tek: \%cRI int-array: *surface-numbers-and-visibilitys*

Setup: SVISIBILITY

integer-array: *surface-numbers-and-visibilitys*

STI: LLVISF (length, *surface-numbers-and-visibilitys*)

Parameters

surface-numbers-and-visibilitys (length 0 to 32768, even)
Specifies an even number of ints, grouped in pairs, that indicate the surface number and visibility mode of the surface.

first element: *surface number*

1 to 8 Surface number

Defaults After FACTORY = 1
Omitted = Error RI11 (Level 2)

second element: *visibility mode*

0 Invisible

1 Visible

2 Blinking (alternating between visible and invisible)

Defaults: After FACTORY = 1
Omitted = Error RI11 (Level 2)

SYNTAX SYNTAX-MODE

§13 Colors, Surfaces

This command either causes a report to be generated, stores the current syntax mode, or recalls the previously stored syntax mode.

Syntax

Syntax-Mode	Tek ANSI
Report-syntax-mode	\%c\#!0
Store-syntax-mode	\%c\#!1
Recall-syntax-mode	\%c\#!2

STI: LLSNTX
(*syntax-mode* [0, 1, or 2])

Parameters

None

TABS *SET-TAB-STOPS**§15 Dialog Area*

Clears and resets tab stops for the active dialog area.

Syntax

Tek: \%cKB int-array: *tab-positions*
 Setup: TABS integer-array: *tab-positions*
 STI: LLTABS (*length, tab-positions*)

Parameters

tab-positions (length 0 to 32768)

Specifies the columns in which tab stops are to be placed.

- 2 Sets tab stops to factory default.
- 1 Sets tab stop at every column position (Setup: **ALL**).
- 0 Clears all horizontal tab stops.
- 1 to 32767 Set tab stop to specified column.
- Defaults: After FACTORY = every eighth column, starting in Column 1, clearing all other tab stops
 Omitted element = 0
 Omitted array = no action

TBC *TABULATION-CLEAR**§15 Dialog Area*

Clears horizontal stops in the active dialog area.

Syntax

ANSI: \%c[Pn: *tab-clear-extent* g
 Setup: None

Parameters

tab-clear-extent

Specifies the extent to which horizontal tabs are cleared.

- 0 Clears the horizontal tab stop at the active position
- 3 Clears all horizontal tab stops
- Defaults: After FACTORY = (none)
 Omitted or 0 = 0

TBMATRIX*SET-TABLET-MATRIX-TRANSFORM**§20 Graphic Input*

Sets the matrix transform for a graphics tablet.

Syntax

Tek: \%cWC int: *tablet-number*
 real-array: *transform-matrix*
 Setup: TBMATRIX integer: *tablet-number*
 real-array: *transform-matrix*
 STI: LLTBMA (*tablet-number, length, transform-matrix*)

Parameters

tablet-number

Specifies the graphics tablet whose transform matrix is to be set.

- 0 to 2 Tablet number.
- Defaults: After FACTORY = (none)
 Omitted = 0

transform-matrix (length 1 or 9)

Specifies the 2-D matrix transform for a graphics tablet. Valid elements are reals.

- Defaults: After FACTORY = <1.0> for all tablets
 Omitted = Error WC21 Level 2

TBSIZE *SET-TABLET-SIZE**§20 Graphic Input*

Sets the size of the active area from which points can be generated on the 4957 and 4958 Graphic Tablets.

Syntax

Tek: E_cIN int: *tablet-size*
 Setup: **TBSIZE** keyword: *tablet-size*
 STI: **LLTBSZ** (*tablet-size*)

Parameters*tablet-size*

Specifies the size of the active area for all 4957 and 4958 Graphic Tablets.

- 0 Same as Large (Setup: **AUTOMATIC**)
- 1 See table below (Setup: **SMALL**)
- 2 See table below (Setup: **LARGE**)
- 3 See table below (Setup: **XLARGE**)

Defaults: After FACTORY = 0
 Omitted = 0

GRAPHICS TABLET SIZES

Tablet	XLARGE	LARGE	SMALL
4957	11.7 x 11.7	11 x 11	10.24 x 10.24
4957 Opt 02	11 x 17	11 x 11	10.24 x 10.24
4958 Opt 03	17 x 24	11 x 11	10.24 x 10.24
4958 Opt 05	36 x 48	30 x 40	30.72 x 38.4
4958 Opt 06	44 x 60	30 x 40	30.72 x 38.4

TCR *TELNET-CARRIAGE-RETURN**§9 Host Communications*

Selects the Network Virtual Terminal end-of-line character. Requires LAN option (Option 3H).

Syntax

Tek: See SET-TELNET-ATTRIBUTES
 Setup: **TCR** string: *logical-device*
 string: *entry*
 STI: See SET-TELNET-ATTRIBUTES

Parameters*logical-device*

The logical device to which this command applies.

HO: The host port.

Defaults: After FACTORY = (none)
 Omitted = (none)

entry

Specifies the NVT end-of-line character.

CRNU Selects ^U as the character to follow ^R .

CRLF Selects ^F as the character to follow ^R .

Defaults: After FACTORY = 0
 Omitted = 0

TDATA *TELNET-NETWORK-DATA-MODE**§9 Host Communications*

Selects the Telnet Network Data mode. Requires LAN option (Option 3H).

Syntax

Tek: See SET-TELNET-ATTRIBUTES
 Setup: **TDATA** string: *logical-device*
 keyword: *data-type*
 STI: See SET-TELNET-ATTRIBUTES

Parameters*logical-device*

The logical device to which this command applies.

HO: The host port.

Defaults: After FACTORY = (none)
 Omitted = (none)

data-type

Specifies the ASCII data type.

ASCII Selects ASCII data type.

BINARY Selects binary data type.

Defaults: After FACTORY = ASCII
 Omitted = (none)

TEKANM *ANSI/VT52-MODE**§4 Command Syntax*

Puts the graphics system into VT52 operating mode.

Syntax

ANSI: $\text{ESC}[?2l$ (Reset: enter VT52 mode)
 $\text{ESC}[?2h$ (Set: stay in ANSI mode)

Setup: None

Parameters

None

TEKARM *AUTOREPEAT-MODE**§10 Keyboards*

Enables or disables automatic repeat for most keyboard keys.

Syntax

ANSI: $\text{ESC}[?8l$ (Reset: AUTOREPEAT NO)
 $\text{ESC}[?8h$ (Set: AUTOREPEAT YES)

Setup: AUTOREPEAT keyword: *mode*

Parameters

mode (Setup only)

YES	Set; turns autorepeat on
NO	Reset; turns autorepeat off
Defaults	After FACTORY = YES Omitted = YES

TEKAWM *AUTOWRAP-MODE**§15 Dialog Area*

Specifies whether the active position wraps automatically to the next line when the end of active line is encountered.

Syntax

ANSI: $\text{ESC}[?7l$ (Reset: Autowrap disabled)
 $\text{ESC}[?7h$ (Set: Autowrap enabled)

Setup: AUTOWRAP
 keyword: *mode*

Parameters

mode

Enables or disables autowrap.

YES	set; enables autowrap
NO	reset; disables autowrap
Defaults:	After FACTORY = YES Omitted = YES

TEKCKM *CURSOR-KEYS-MODE**§10 Keyboards*

Controls whether the cursor keys transmit cursor-movement commands or application code sequences.

Syntax

ANSI: $\text{ESC}[?1l$ (Reset: CURSORKEYMODE NO)
 $\text{ESC}[?1h$ (Set: CURSORKEYMODE YES)

Setup: CURSORKEYMODE keyword: *mode*

Parameters

mode (Setup only)

Specifies the codes transmitted by the cursor keys.

NO	Reset; cursor keys transmit cursor-movement commands
YES	Set; cursor keys transmit application code sequences
Defaults:	After FACTORY = NO Omitted = YES

TEKCOLM COLUMN-MODE

§15 Dialog Area

Selects a character size and dialog viewport and buffer widths for the active dialog area.

Syntax

ANSI: $\text{\textasciitilde{c}}[?3l$ (Reset: 80 columns)
 $\text{\textasciitilde{c}}[?3h$ (Set: 132 columns)

Setup: COLUMNMODE
 integer: *column-mode*

Parameters

column-mode (Setup only)

Specifies parameters for CHARSIZE, DACHARS and DAWIDTH:

80	CHARSIZE 1,24,80; DACHARS 80; DAWIDTH 80
132	CHARSIZE 1,24,132; DACHARS 132; DAWIDTH 132
Defaults:	After FACTORY command: 80 Omitted = 80

TEKDHL DOUBLE-HEIGHT-LINE

§15 Dialog Area

Makes the active line the top half or bottom half of a double-height, double-width line.

Syntax

ANSI: $\text{\textasciitilde{c}}\#3$ (Top half double-height line)
 $\text{\textasciitilde{c}}\#4$ (Bottom half double-height line)

Setup: None

Parameters

None

TEKDWL DOUBLE-WIDTH-LINE

§15 Dialog Area

Makes the active line a double-width line.

Syntax

ANSI: $\text{\textasciitilde{c}}\#6$

Setup: None

Parameters

None

TEKHEADER TEK-HEADER-CHARACTER

§9 Host Communications

(Requires Coax Option)

This command sets the Tek Header Character for Tek-style graphics from an IBM host.

Syntax

Tek: $\text{\textasciitilde{c}}\text{OI}$ int : *header-character*

Setup: TEKHEADER integer: *header-character*

Parameters

header-character

Specifies the Tek header character.

64 to 254 Specifies the EBCDIC value of the Tek header character.

Defaults: After FACTORY = 112
 Omitted = 0

TEKID IDENTIFY-TERMINAL

§3 System Initialization

Causes the graphics system to send the same reports as those sent by DEC VT100 and VT200 terminals.

Syntax

ANSI: $\text{\textasciitilde{c}}Z$

Setup: None

Parameters

None

TEKKANAM KATAKANA-SHIFT-MODE*§10 Keyboards*

Selects between ASCII and Katakana modes for the Katakana keyboard.

Syntax

ANSI: $\text{E}_c[?12\text{i}]$ (Reset: ASCII mode)
 $\text{E}_c[?12\text{h}]$ (Set: Katakana mode)

Setup: None

Parameters

None

TEKKBUM KEYBOARD-USAGE-MODE*§10 Keyboards*

Sets the byte mapping of international keyboards.

Syntax

ANSI: $\text{E}_c[?68\text{h}]$ (Set: Data Processing Keys mode)
 $\text{E}_c[?68\text{i}]$ (Reset: Typewriter mode)

Setup: **KEYUSEMODE**
 keyword: *keyboard-usage-mode*

STI: None.

Parameters

keyboard-usage-mode (Setup only)

Specifies whether the keyboard is in Data Processing Keys mode or Typewriter mode.

TYPEWRITER

Typewriter mode

DPROCESSING

Data Processing Keys mode

Defaults: After **FACTORY** = **TYPEWRITER**
 Omitted = **DPROCESSING**

TEKKEM KEY-EXPANSION-MODE*§7 Macros*

Enables or disables key-press expansion of Tek macros.

Syntax

ANSI: $\text{E}_c[<3\text{i}]$ (Reset: Key expansion enabled)
 $\text{E}_c[<3\text{h}]$ (Set: Key expansion disabled)

Setup: See **KEYEXPAND**

Parameters

None

TEKKKDM KANJI/KATAKANA-DISPLAY-MODE*§14 Text*

Designates character sets for Kanji or Katakana display, in language type **DECKANJI** only.

Syntax

ANSI: $\text{E}_c[?59\text{i}]$ (Reset: Katakana mode)
 $\text{E}_c[?59\text{h}]$ (Set: Kanji mode)

Setup: None

Parameters

None

TEKKPAM KEYPAD-APPLICATION-MODE*§10 Keyboards*

This command sets the numeric keypad to send non-numeric characters.

Syntax

ANSI: $\text{E}_c=$

Setup: **KEYPADMODE APPLICATION**

Parameters

None

TEKKPNM *KEYPAD-NUMERIC-MODE*

§10 Keyboards

This command sets the numeric keypad to send numeric codes.

Syntax

ANSI: $\text{c} >$

Setup: **KEYPADMODE NUMERIC**

Parameters

None

TEKNRCM *NATIONAL-REPLACEMENT-CHARACTER-SET-MODE*

§10 Keyboards

Selects the National or DEC Multinational keyboard character set.

Syntax

ANSI: $\text{c} [?42\text{i}]$ (Reset: DEC Multinational)
 $\text{c} [?42\text{h}]$ (Set: National)

Setup: See SKCS

Parameters

None

TEKOM *ORIGIN-MODE*

§15 Dialog Area

Sets Origin mode for the active dialog area to Absolute or Relative.

Syntax

ANSI: $\text{c} [?6\text{l}]$ (Reset: Absolute)
 $\text{c} [?6\text{h}]$ (Set: Relative)

Setup: **ORIGINMODE**
keyword: *mode*

Parameters

mode (Setup only)

ABSOLUTE Cursor addresses are relative to the origin of the dialog buffer

RELATIVE Cursor addresses are relative to the origin of the scrolling region

Defaults: After **FACTORY** = **ABSOLUTE**
Omitted = **ABSOLUTE**

TEKORM *OVERSTRIKE/REPLACE-MODE*

§15 Dialog Area

Controls whether Space and Underscore characters overstrike or replace existing characters in the active dialog area.

Syntax

ANSI: $\text{c} [<1\text{l}]$ (Reset: Replace)
 $\text{c} [<1\text{h}]$ (Set: Overstrike)

Setup: See DAMODE

Parameters

None

TEKPEX *PRINT-EXTENT-MODE*

§11 Peripherals

Specifies whether an MC command prints the whole dialog buffer or just the scrolling region.

Syntax

ANSI: $\text{c} [?19\text{h}]$ (Set: Dialog Buffer)
 $\text{c} [?19\text{l}]$ (Reset: Scrolling Region)

Setup: None

Parameters

None

TEKPPF *PRINT-FORM-FEED-MODE*

§11 Peripherals

Specifies whether a dialog copy initiated by the MC command is terminated by a Form Feed.

Syntax

ANSI: $\text{Pc}[\text{?18h}$ (Set: Print Form Feed)
 $\text{Pc}[\text{?18l}$ (Reset: No Form Feed)

Setup: None

Parameters

None

TEKRC *RESTORE-CURSOR*

§15 Dialog Area

Restores the active dialog area's attributes previously saved by TEKSC.

Syntax

ANSI: $\text{Pc}8$

Setup: None

Parameters

None

TEKSC *SAVE-CURSOR*

§15 Dialog Area

Saves several attributes of the active dialog area for later recall by TEKRC.

Syntax

ANSI: $\text{Pc}7$

Setup: None

Parameters

None

TEKSCA *SELECT-CHARACTER-ATTRIBUTES*

§15 Dialog Area

Controls whether subsequent characters are protected against selective erasure for the active dialog area.

Syntax

ANSI: $\text{Pc}[\text{Pn: } \textit{erase-attribute}$ "q

Setup: None

Parameters*erase-attribute*

Specifies whether future displayed characters are selectively erasable.

- | | |
|---|---|
| 0 | Characters are selectively erasable |
| 1 | Characters are not selectively erasable |
| 2 | Characters are selectively erasable |

Defaults: After FACTORY = 0
 Omitted = 0

TEKSCL *SET-COMPATIBILITY-LEVEL*

§3 System Initialization

Either (1) selects the DEC terminal model to emulate and the method used to transmit C1 control characters in key definitions and ANSI reports or (2) emulates the TERMINAL command by specifying which Tektronix graphics system model to report in subsequent Terminal-Settings-Reports.

Syntax

ANSI: $\text{Pc}[\text{Ps: } \textit{terminal-type}$
 $\text{Ps: } \textit{cl-transmission-mode}$ "p

Setup: None

Parameters

terminal-type

Selects terminal type.

- 61 Selects VT100 compatibility mode
- 62 Selects VT200 compatibility mode
- <*n* Specifies the model number *n* that the graphics system returns in a Terminal-Settings-Report; the value <0 specifies that the graphics system returns its actual model number. Must be in the range 0 through 32767.

Defaults: After FACTORY = (none)
Omitted = Error ["11

c1-transmission-mode

Specifies whether C1 control characters are transmitted as seven-bit escape sequences or as single eight-bit control characters. (Ignored unless the first parameter is 62.)

- 0 Selects eight-bit C1 transmission mode.
- 1 Selects seven-bit C1 transmission mode
- 2 Selects eight-bit C1 transmission mode

Defaults: After FACTORY = (none)
Omitted = 1 if *terminal-type* is 61;
2 if *terminal-type* is 62

TEKSCNM SCREEN-MODE

§15 Dialog Area

Selects between normal and reversed screen video.

Syntax

ANSI: $\text{\textbackslash c}[?5l$ (Reset: Normal screen)
 $\text{\textbackslash c}[?5h$ (Set: Reversed screen)

Setup: SCREENMODE
keyword: *mode*

Parameters

mode (Setup only)

- NORMAL Selects normal screen video
 - REVERSE Selects reverse screen video
- Defaults: After FACTORY = NORMAL
Omitted = NORMAL

TEKSE SAVE-ENVIRONMENT

§8 File System

Saves a graphics system environment to the host port or to the graphics system's memory.

Syntax

Tek: $\text{\textbackslash c}\#\%$ *destination*

ANSI: Same as Tek.

Setup: None

Parameters

destination

Specifies the device to which the environment will be sent. Must be one of the following:

- :
 - n*
- Sends data to the host port
- Sends data to pseudofile *Mn*; in the graphics system's memory (*n* must be in the range 0—9)

Defaults: After FACTORY = (none)
Omitted = (none)

TEKSTBM SET-TOP-AND-BOTTOM-MARGINS

§15 Dialog Area

Sets top and bottom edit margins for the active dialog area's buffer.

Syntax

ANSI: $\text{\textbackslash c}[$ *Pn: top-margin* ;
Pn: bottom-margin *r*

Setup: EDITMARGINS
integer: *top-margin*
integer: *bottom-margin*

Parameters

top-margin

Specifies the top row of the scrolling region. Valid values are 0 to 32767.

Defaults: After FACTORY = 1
Omitted or 0 = 1

bottom-margin

Specifies the bottom row number of the scrolling region. Valid values are 0 to 32767.

Defaults: After FACTORY = 128
Omitted or 0 = size of dialog buffer in lines

TEKSTR *SOFT-TERMINAL-RESET**§15 Dialog Area*

Resets certain graphics system attributes.

SyntaxANSI: $\text{ESC}[!p$

Setup: None

TEKSWL *SINGLE-WIDTH-LINE**§15 Dialog Area*

Causes the active line to become a single-height, single-width line.

SyntaxANSI: $\text{ESC}\#5$

Setup: None

Parameters

None

TEKTCM *TEXT-CURSOR-ENABLE-MODE**§15 Dialog Area*

Makes the active dialog area's alpha cursor visible or invisible.

SyntaxANSI: $\text{ESC}[?25h$ (Set: Cursor enabled)
 $\text{ESC}[?25l$ (Reset: Cursor disabled)Setup: **CURSORENABLE**
keyword: *cursor-enable-mode***Parameters***cursor-enable-mode* (Setup only)

YES	Makes the alpha cursor visible.
NO	Makes the alpha cursor invisible.
Defaults:	After FACTORY = YES Omitted = YES

TERMINAL *SET-TERMINAL-MODEL**§3 System Initialization*

Changes the graphics system model number reported to the host. Used for compatibility with applications that do not recognize the factory model number.

SyntaxSetup: **TERMINAL** integer: *model-number***Parameters***model-number*

Specifies a graphics system model number.

0 to 32767 A graphics system model number.

Defaults: After FACTORY = Actual graphics system model number.
0 or Omitted = Actual graphics system model number.

TESCAPE *TELNET-ESCAPE-CHARACTER**§9 Host Communications*

Selects the Telnet "escape to local" character. Requires LAN option (Option 3H).

Syntax

Tek: See SET-TELNET-ATTRIBUTES

Setup: **TESCAPE** string: *logical-device*
char: *escape-character*

STI: See SET-TELNET-ATTRIBUTES

Parameters*logical-device*

The logical device to which this command applies.

HO: The host port.

Defaults: After FACTORY = (none)
Omitted = (none)

escape-character

The ADE value of the escape-to-local character. Valid range is 0 to 255.

Defaults: After FACTORY = 29 (Ctrl-])
Omitted = No change

TEXTRENDITION *See SGR*

TLOCAL *TELNET-LOCAL-MODE*

§9 Host Communications

Selects Telnet Local mode. Requires LAN option (Option 3H).

Syntax

Tek: See SET-TELNET-ATTRIBUTES

Setup: TLOCAL string: *logical-device*

STI: See SET-TELNET-ATTRIBUTES

Parameters

logical-device

The logical device to which this command applies.

HO: The host port.

Defaults: After FACTORY = (none)
Omitted = (none)

TMETHOD *TRANSLATION-METHOD*

§9 Host Communications

(Requires Coax Option)

Specifies the method that the graphics system uses during coax communications to translate characters in the coax interface buffer.

Syntax

Setup: TMETHOD integer: *translation-method*

Parameters

translation-method

Specifies a translation method.

0 ASCII-to-EBCDIC translate table method.

1 ASCII-plus-constant method

Defaults: After FACTORY = 1
Omitted = 0

TPASSTHRU *TELNET-PASSTHRU-MODE*

§9 Host Communications

Selects Telnet Passthru mode. Requires LAN option (Option 3H).

Syntax

Tek: See SET-TELNET-ATTRIBUTES

Setup: TPASSTHRU string: *logical-device*
keyword: *passthru-mode*

STI: See SET-TELNET-ATTRIBUTES

Parameters

logical-device

The logical device to which this command applies.

HO: The host port.

Defaults: After FACTORY = (none)
Omitted = (none)

passthru-mode

Specifies the Telnet passthru mode.

OFF Disable Passthru mode

ON Enables Passthru mode

TOGGLE Toggle

Defaults: After FACTORY = OFF
Omitted = OFF

VATTRIBUTES SET-VIEW-ATTRIBUTES*§17 Viewing System*

Sets the surface, wipe index and border index of the current view.

Syntax

Tek: E_cRA int: *surface-number*
 int: *wipe-index*
 int: *border-index*

Setup: VATTRIBUTES integer: *surface-number*
 integer: *wipe-index*
 integer: *border-index*

STI: LLVWAT (*surface-number, wipe-index,*
 border-index)

Parameters*surface-number*

Specifies the surface which the current view's viewport is displayed on.

–1 The super surface.

0 No change 1 to 8 Specifies a particular surface defined previously with the SDEFINITIONS command.

Defaults: After FACTORY = 1
 Omitted = 0

wipe-index

Specifies the color index used for wiping (erasing) the viewport.

–1 Viewport not erased

0 to 32767 A specific index

Defaults: After FACTORY = 0
 Omitted = 0

border-index

Specifies the color index used for displaying a border around the viewport, for displaying the framing boxes for Zoom and Pan functions, and for displaying the crosshair and alpha cursors.

0 to 65535

Defaults: After FACTORY = 1
 Omitted = 0

VCLUSTER SET-VIEW-DISPLAY-CLUSTER*§17 Viewing System*

Defines or deletes view display clusters depending on the length and values in *view-numbers*.

Syntax

Tek: E_cRQ int-array: *view-numbers*

Setup: VCLUSTER integer-array: *view-numbers*

STI: LLVWDC (*length, view-numbers*)

Parameters

view-numbers (length 0 to 32768)

Specifies the view-number.

Length 0 deletes all view-display-clusters

Length 1 to $2^{28} - 1$ specifies a view-display-cluster

Valid element values are in the range from –2 to 64, as follows:

–2 deletes the cluster containing the current view

–1 all views 1 to 64

0 the current view

1 to 64 a specific view

Defaults: After FACTORY = no clusters
 Omitted = no clusters

VDELETE DELETE-VIEW*§17 Viewing System*

Specifies a view to be deleted.

Syntax

Tek: E_cRK int: *view-number*

Setup: VDELETE integer: *view-number*

STI: LLDLVW (*view-number*)

Parameters

view-number

Specifies the view to be deleted.

- 1 all views
- 0 the current view
- 1 to 64 a specified view
- Defaults: After FACTORY = (none)
Omitted = 0

VIEWPORT *SET-VIEWPORT*

§17 Viewing System

Sets the position of the current view's viewport in normalized screen space.

Syntax

- Tek: RCRV *xy: first-corner*
xy: second-corner
- Setup: VIEWPORT *xy: first-corner*
xy: second-corner
- STI: LLVWPT *{first-corner [x,y], second-corner [x,y]}*
- LLVWP4 *{first-corner [x,y], second-corner [x,y]}*

Parameters

first-corner

Location of one corner of the current view's viewport, in normalized screen space coordinates.

- x=0 to 4095; y=0 to 3071
- Defaults: After FACTORY = 0,0
Omitted = 0,0

second-corner

Location of the opposite corner of the viewport, in normalized screen space coordinates.

- x=0 to 4095; y=0 to 3071
- Defaults: After FACTORY = 4095,3071

VSELECT *SELECT-VIEW*

§17 Viewing System

Selects an already existing view, or creates a new view.

Syntax

- Tek: RCRC *int: view-number*
- Setup: VSELECT *integer: view-number*
- STI: LLSLVW *(view-number)*

Parameters

view-number

Specifies the view to be selected or created.

- 1 The next lower-numbered view which currently exists.
- 0 The next higher-numbered view which currently exists.
- 1 to 64 A specific view.
- Defaults: After FACTORY = 1
Omitted = 0

VT *VERTICAL-TAB*

§14 Text

Moves the active position one line downward in the dialog area (or moves the alpha position one line *upward* in the graphics area if no dialog area is enabled).

Syntax

- Tek: VT
- ANSI: VT
- VT52: VT
- Setup: None
- STI: None

Parameters

None

WINDOW *SET-WINDOW**§17 Viewing System*

Specifies the window for the current view and all the views in the current view's view cluster.

Syntax

Tek: \mathbb{E}_c RW xy: *first-corner*
 xy: *second-corner*

Setup: WINDOW xy: *first-corner*
 xy: *second-corner*

STI: LLWIND (*first-corner* [x,y], *second-corner* [x,y])

 LLWIN4 (*first-corner* [x,y], *second-corner* [x,y])

Parameters

first-corner (x,y = -2^{31} to $2^{31}-1$)

Specifies one corner of the window in 2-D world space coordinates for the current view.

Defaults: After FACTORY = 0,0
 Omitted = 0,0

second-corner (x,y = -2^{31} to $2^{31}-1$)

Specifies the opposite corner of the window in 2-D world space coordinates.

Defaults: After FACTORY = 4095,3276
 Omitted = 0,0

XMTDELAY *SET-TRANSMIT-DELAY**§9 Host Communications*

Sets the graphics system's delay between transmitting lines of data to the host.

Syntax

Tek: \mathbb{E}_c ND int: *transmit-delay*

Setup: XMTDELAY integer: *transmit-delay*

STI: LLXMTD (*transmit-delay*)

Parameters

transmit-delay

Specifies the transmit delay in milliseconds. Valid values are 0 to 65535.

Defaults: After FACTORY = 100
 Omitted = 0

XMTLIMIT *SET-TRANSMIT-RATE-LIMIT**§9 Host Communications*

Imposes an upper bound on how fast the RS-232-C host port sends characters to the host computer.

Syntax

Tek: \mathbb{E}_c NL int: *rate-limit*

Setup: XMTLIMIT integer: *rate-limit*

STI: LLXMTL (*rate-limit*)

Parameters

rate-limit

Transmit rate limit, in bits per second, for the host port. Valid range is 110 to 65535.

Defaults: After FACTORY = 19200
 Omitted = error NL11 (Level 2)

IBM 3179G/3279 ERROR CODES

This section summarizes the GDDM error codes (IBM 3174/3274 machine-check errors, Tektronix coax option machine-check errors, and Tektronix coax option program-check errors).

GDDM ERROR CODES

IBM 3174/3274 Machine-Check Errors

The error codes shown in the following table can appear in the operator information area. These error conditions are generated by the IBM 3174/3274 control unit.

IBM 3174/3274 MACHINE-CHECK ERRORS

Error Codes	Cause	Action
240	Synchronization error based on coax option interface	Power graphics system off, then on again
241	Synchronization error based on IBM 3174/3274 problem	Power graphics system off, then on again

Tektronix Coax Option Machine-Check Errors

The machine-check error codes shown in the following table are generated by the coax option interface. (Does not apply to GS4207.)

TEKTRONIX COAX OPTION MACHINE-CHECK ERRORS

Error Codes	Cause	Action
610	IBM 3174/3274 not ready	1. Check to see IBM 3174/3274 is powered on 2. Check to see if coax cable is connected 3. Power graphics system off, then on again
654	IBM 3174/3274 to device protocol error	1. Turn graphics system off, then on again 2. Run graphics system selftest
656	Ready timeout error.	Turn graphics system off, then on again
698	Overflow of Asynchronous status queue	Turn graphics system off, then on again

Tektronix Coax Option Program-Check Errors

The program-check error codes shown in the following table are generated by the coax option interface. These errors usually can be reset by pressing the Reset key on the keyboard. If these errors persist, contact your local host support programmer.

TEKTRONIX COAX OPTION PROGRAM-CHECK ERRORS




Error Code	Cause
702	SNA Request Unit too long
703	SNA Unsupported Function
704	Invalid format indicator bit
705	SNA Sequence number error
706	SNA Chaining error
707	SNA Bracket state error
708	SNA Data traffic reset state error
709	HDX error
712	SNA Bracket bid reject
713	SNA Session already bound
714	No LU-LU session
715	SNA Logical Unit not active
716	SNA insufficient number of bytes in the Bind Request Unit
721	SNA Request Unit less than 64 bytes long
722	Invalid combination of SNA Pacing Count and Outbound Request Unit size
723	Invalid logical unit type
726	Negative SNA response from the host
727	SNA Exception request received from the host
728	A Read command received with End Bracket or Change Direction flag set
729	A Read Partition Structured Field received when in Retry state
750	Invalid SNA command received
751	Start Field Extended, Modify Field, or Set Attribute order with invalid character set value
752	Invalid Address received in a Set Buffer Address, Repeat to Address or an Erase Unprotected to Address Order
753	Data is following a Read Modified, Read Modified All, Read Buffer or a Erase All Unprotected Order

(continued)

TEKTRONIX COAX OPTION PROGRAM-CHECK ERRORS (cont)

Error Code	Cause
754	Data Stream was terminated before all required bytes were received
755	Invalid 3270 Data Stream order received
756	Invalid structured field type or type not supported
757	Load Programmed Symbol Structured Field type not supported
758	Error in Set Reply Mode Structured Field
759	1. Read Partition Structured Field not last Structured Field 2. Structured Field type incomplete 3. Structured Field length invalid 4. Length of Structured field was zero but it is not the last Structured Field 5. Load Programmed Symbol Structured Field length error
760	1. Erase/Reset Structured Field reserved fields not zero 2. Set Reply Mode Structured field attribute type reserved
761	Partition ID of Structured Field invalid
762	Create Partition ID Structured Field invalid
764	Invalid Load Programmed Symbol Structured Field
765	Invalid Load Programmed Symbol Structured Field
766	Invalid Load Programmed Symbol Structured Field
767	Invalid Create Partition Structured Field
768	Invalid Load Programmed Symbol Structured Field
769	Invalid Load Programmed Symbol Structured Field
770	Outbound 3270 Structured Field with start print bit in WCC set, but is not the last Structured Field
771	Invalid command in Structured Field
780	Miscellaneous Graphics Program Check
781	Graphics Drawing Order error
782	Graphics Procedure Order error


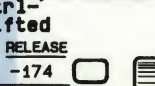
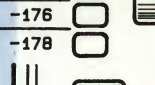

MACROS FOR MOUSE (OPTION 4M)

Unshifted Shifted Ctrl Ctrl-Shifted						
	PRESS	RELEASE	PRESS	RELEASE	PRESS	RELEASE
	-155	-156	-157	-158	-159	-160
	-161	-162	-163	-164	-165	-166
	-167	-168	-169	-170	-171	-172
	-173	-174	-175	-176	-177	-178

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Figure G-1. Macro Numbers for the Mouse Buttons.

MACROS FOR THUMBWHEELS (4200F4T)

Unshifted Shifted Ctrl Ctrl-Shifted								
	PRESS	RELEASE	PRESS	RELEASE	PRESS	RELEASE	PRESS	RELEASE
	-155	-156	-161	-162	-167	-168	-173	-174
	-157	-158	-163	-164	-169	-170	-175	-176
	-159	-160	-165	-166	-171	-172	-177	-178

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Figure G-2. Macro Numbers for Thumbwheels.

NORTH AMERICAN KEYBOARD

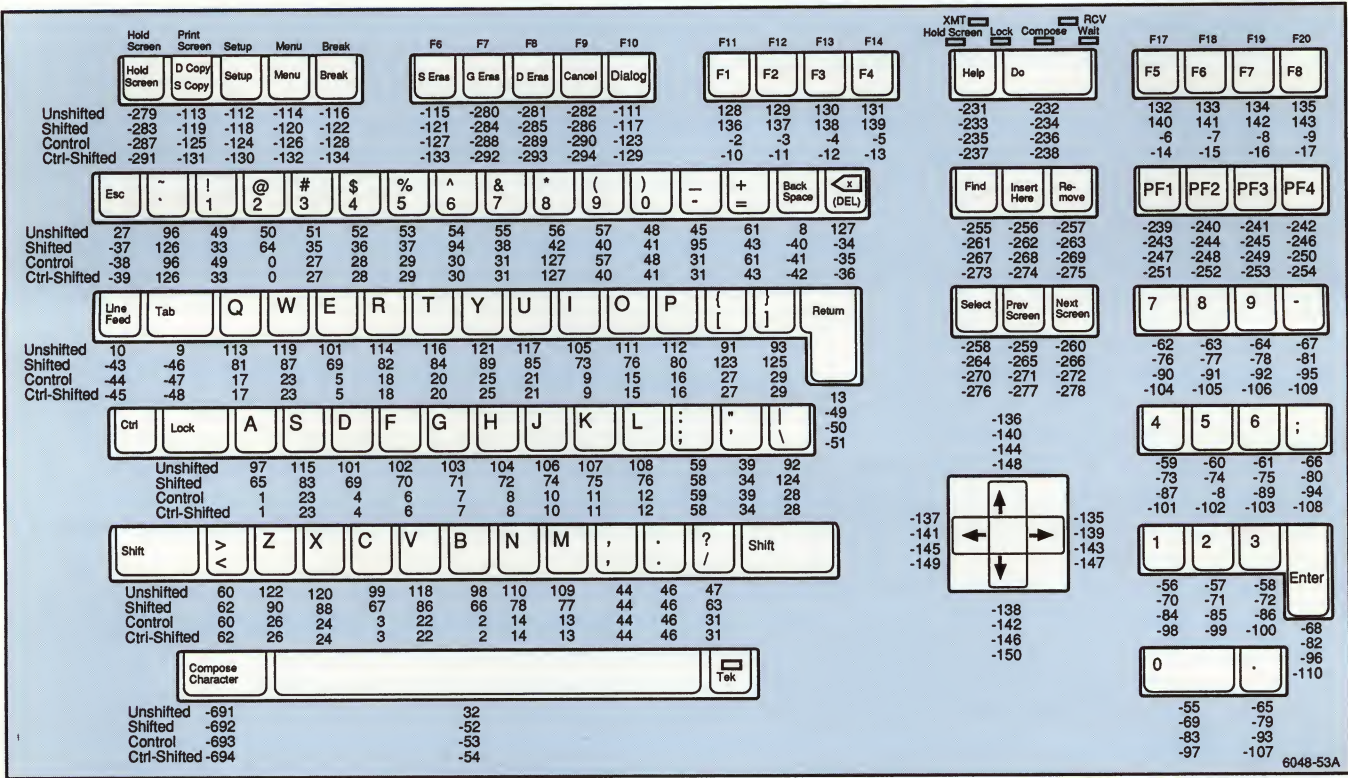


Figure G-3. North American Keyboard (Standard): Layout and Key Macro Numbers.

NORTH AMERICAN KEYBOARD (COAX)

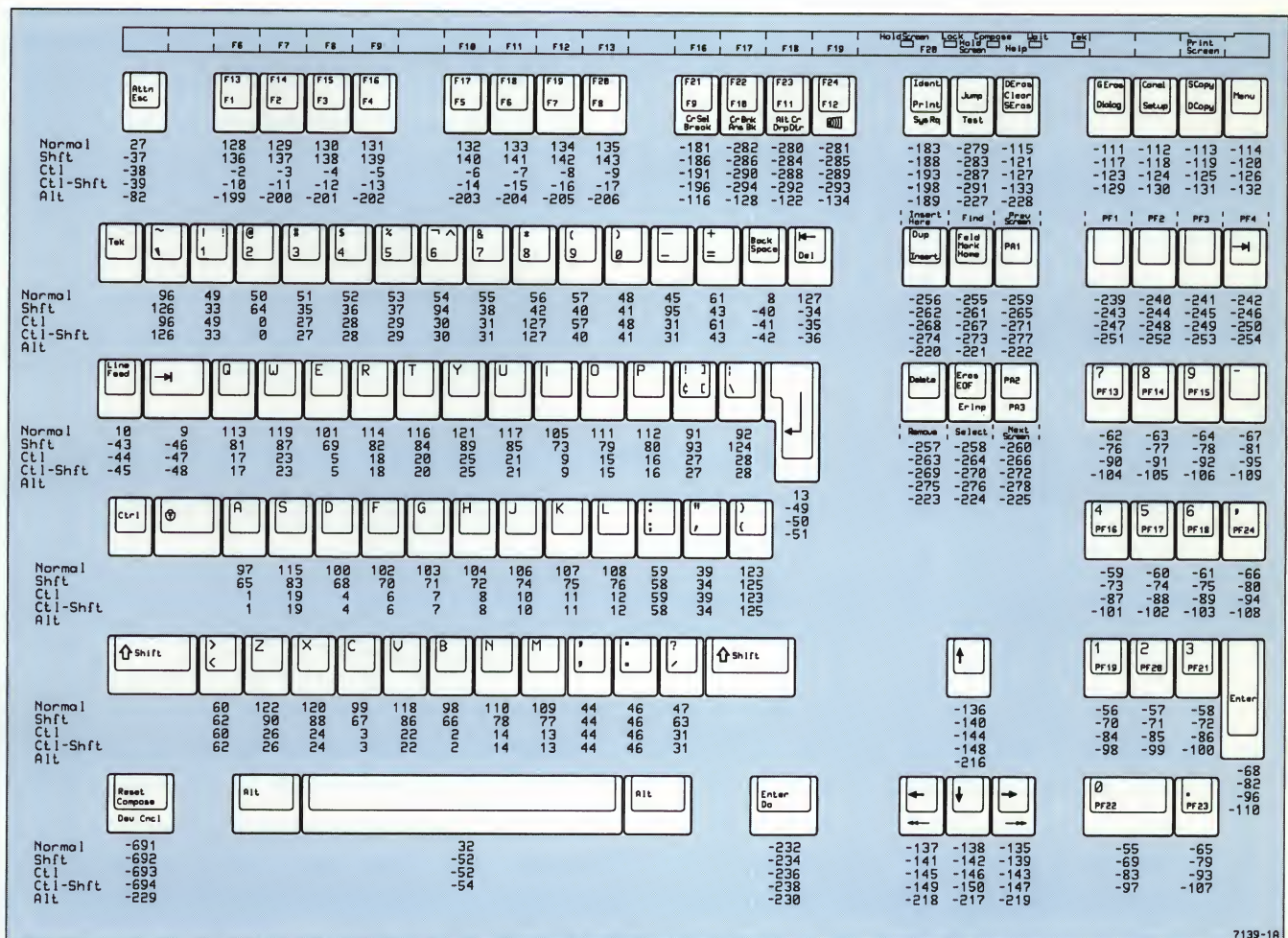


Figure G-4. North American Keyboard (Coax): Layout and Key Macro Numbers.

DANISH/NORWEGIAN CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	BITS				8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5
	4	3	2	1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1
0	0	0	0	0		0 32	@ 48	P 64	` 96	p 112
1	0	0	0	1	! 33	1 49	A 65	Q 81	a 97	q 113
2	0	0	1	0	" 34	2 50	B 66	R 82	b 98	r 114
3	0	0	1	1	# 35	3 51	C 67	S 83	c 99	s 115
4	0	1	0	0	\$ 36	4 52	D 68	T 84	d 100	t 116
5	0	1	0	1	% 37	5 53	E 69	U 85	e 101	u 117
6	0	1	1	0	& 38	6 54	F 70	V 86	f 102	v 118
7	0	1	1	1	' 39	7 55	G 71	W 87	g 103	w 119
8	1	0	0	0	(40	8 56	H 72	X 88	h 104	x 120
9	1	0	0	1	) 41	9 57	I 73	Y 89	i 105	y 121
10	1	0	1	0	* 42	:	J 74	Z 90	j 106	z 122
11	1	0	1	1	+ 43	;	K 75	Æ 91	k 107	æ 123
12	1	1	0	0	, 44	< 60	L 76	Ø 92	l 108	ø 124
13	1	1	0	1	- 45	= 61	M 77	Å 93	m 109	å 125
14	1	1	1	0	· 46	> 62	N 78	^ 94	n 110	— 126
15	1	1	1	1	/ 47	? 63	O 79	— 95	o 111	— 127

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Figure G-5. Danish/Norwegian Character Set.

FRENCH CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	BITS				8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5
	4	3	2	1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1
0	0	0	0	0		0 32	ø 48	à 64	P 80	µ 96
1	0	0	0	1	! 33	1 49	A 65	Q 81	a 97	q 113
2	0	0	1	0	" 34	2 50	B 66	R 82	b 98	r 114
3	0	0	1	1	£ 35	3 51	C 67	S 83	c 99	s 115
4	0	1	0	0	\$ 36	4 52	D 68	T 84	d 100	t 116
5	0	1	0	1	% 37	5 53	E 69	U 85	e 101	u 117
6	0	1	1	0	& 38	6 54	F 70	V 86	f 102	v 118
7	0	1	1	1	' 39	7 55	G 71	W 87	g 103	w 119
8	1	0	0	0	(40	8 56	H 72	X 88	h 104	x 120
9	1	0	0	1	) 41	9 57	I 73	Y 89	i 105	y 121
10	1	0	1	0	* 42	:	J 74	Z 90	j 106	z 122
11	1	0	1	1	+ 43	;	K 75	° 91	k 107	é 123
12	1	1	0	0	, 44	< 60	L 76	ç 92	l 108	ù 124
13	1	1	0	1	- 45	= 61	M 77	š 93	m 109	è 125
14	1	1	1	0	· 46	> 62	N 78	^ 94	n 110	— 126
15	1	1	1	1	/ 47	? 63	O 79	— 95	o 111	— 127

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Figure G-6. French Character Set.

GERMAN CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0		32 0	48 S	64 P	80 `	96 p
1	0	0	0	1		33 !	49 1	65 A	81 Q	97 a
2	0	0	1	0		34 "	50 2	66 B	82 R	98 b
3	0	0	1	1		35 #	51 3	67 C	83 S	99 c
4	0	1	0	0		36 \$	52 4	68 D	84 T	100 d
5	0	1	0	1		37 %	53 5	69 E	85 U	101 e
6	0	1	1	0		38 &	54 6	70 F	86 V	102 f
7	0	1	1	1		39 '	55 7	71 G	87 W	103 g
8	1	0	0	0		40 (	56 8	72 H	88 X	104 h
9	1	0	0	1		41)	57 9	73 I	89 Y	105 i
10	1	0	1	0		42 *	58 :	74 J	90 Z	106 j
11	1	0	1	1		43 +	59 ;	75 K	91 Ä	107 k
12	1	1	0	0		44 ,	60 <	76 L	92 Ö	108 l
13	1	1	0	1		45 -	61 =	77 M	93 Ü	109 m
14	1	1	1	0		46 .	62 >	78 N	94 ^	110 n
15	1	1	1	1		47 /	63 ?	79 O	95 _	111 o

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Figure G-7. German Character Set.

GREEK CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0		32 °	48 ÿ	64 Π	80 ü	96 π
1	0	0	0	1		33 ±	49 Α	65 Ρ	81 α	97 ρ
2	0	0	1	0		34 '²	50 Β	66 ς	82 β	98 ς
3	0	0	1	1		35 £³	51 Γ	67 Σ	83 γ	99 σ
4	0	1	0	0		36 ؟	52 Δ	68 Τ	84 δ	100 τ
5	0	1	0	1		37 ؟	53 Ε	69 Υ	85 ε	101 υ
6	0	1	1	0		38 ¡	54 Á	70 Ζ	86 Φ	92 ζ
7	0	1	1	1		39 §	55 ·	71 Η	87 Χ	93 η
8	1	0	0	0		40 "É	56 Θ	72 Ψ	88 θ	94 ψ
9	1	0	0	1		41 ©	57 Æ	73 Ι	89 Ω	95 ι
10	1	0	1	0		42 ¿	58 Í	74 Κ	90 Æ	96 κ
11	1	0	1	1		43 «	59 »	75 Λ	91 Æ	97 λ
12	1	1	0	0		44 ¬	60 Ó	76 Μ	92 ά	98 μ
13	1	1	0	1		45 −	61 ½	77 Ν	93 έ	99 ν
14	1	1	1	0		46 ؟	62 Ý	78 Ξ	94 ή	100 ξ
15	1	1	1	1		47 −	63 Ω	79 Ο	95 ί	101 ο

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Figure G-8. Greek Character Set.

ITALIAN CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0		ø 32	š 48	š 64	ü 96	p 112
1	0	0	0	1	!	1 33	A 49	Q 65	a 97	q 113
2	0	0	1	0	"	2 34	B 50	R 66	b 98	r 114
3	0	0	1	1	£	3 35	C 51	S 67	c 99	s 115
4	0	1	0	0	\$	4 36	D 52	T 68	d 100	t 116
5	0	1	0	1	%	5 37	E 53	U 69	e 101	u 117
6	0	1	1	0	&	6 38	F 54	V 70	f 102	v 118
7	0	1	1	1	'	7 39	G 55	W 71	g 103	w 119
8	1	0	0	0	(	8 40	H 56	X 72	h 104	x 120
9	1	0	0	1	)	9 41	I 57	Y 73	i 105	y 121
10	1	0	1	0	*	10 42	: 58	J 74	z 90	j 106
11	1	0	1	1	+	11 43	; 59	K 75	° 91	k 107
12	1	1	0	0	,	12 44	< 60	L 76	ç 92	l 108
13	1	1	0	1	-	13 45	= 61	M 77	é 93	m 109
14	1	1	1	0	•	14 46	> 62	N 78	^ 94	n 110
15	1	1	1	1	/	15 47	? 63	O 79	— 95	o 111

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Figure G-9. Italian Character Set.

JIS KATAKANA CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0		ー 32	タ 48	ミ 64	？ 96	？ 112
1	0	0	0	1	。 33	ア 49	チ 65	ム 81	？ 97	？ 113
2	0	0	1	0	「 34	イ 50	ツ 66	メ 82	？ 98	？ 114
3	0	0	1	1	」 35	ウ 51	テ 67	モ 83	？ 99	？ 115
4	0	1	0	0	、 36	エ 52	ト 68	ヤ 84	？ 100	？ 116
5	0	1	0	1	・ 37	オ 53	ナ 69	ユ 85	？ 101	？ 117
6	0	1	1	0	ヲ 38	カ 54	ニ 70	ヨ 86	？ 102	？ 118
7	0	1	1	1	ア 39	キ 55	ヌ 71	ラ 87	？ 103	？ 119
8	1	0	0	0	イ 40	ク 56	ネ 72	リ 88	？ 104	？ 120
9	1	0	0	1	ウ 41	ケ 57	ノ 73	ル 89	？ 105	？ 121
10	1	0	1	0	エ 42	コ 58	ハ 74	レ 90	？ 106	？ 122
11	1	0	1	1	オ 43	サ 59	ヒ 75	ロ 91	？ 107	？ 123
12	1	1	0	0	ヤ 44	シ 60	フ 76	ワ 92	？ 108	？ 124
13	1	1	0	1	ユ 45	ス 61	ヘ 77	ン 93	？ 109	？ 125
14	1	1	1	0	ヨ 46	セ 62	ホ 78	・ 94	？ 110	？ 126
15	1	1	1	1	ツ 47	ソ 63	マ 79	。 95	？ 111	？ 127

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Figure G-10. JIS Katakana Character Set.

JIS ROMAN CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	32	0	@	P	`	p
1	0	0	0	1	33	1	A	Q	a	q
2	0	0	1	0	34	2	B	R	b	r
3	0	0	1	1	35	3	C	S	c	s
4	0	1	0	0	36	4	D	T	d	t
5	0	1	0	1	37	5	E	U	e	u
6	0	1	1	0	38	6	F	V	f	v
7	0	1	1	1	39	7	G	W	g	w
8	1	0	0	0	40	8	H	X	h	x
9	1	0	0	1	41	9	I	Y	i	y
10	1	0	1	0	42	:	J	Z	j	z
11	1	0	1	1	43	;	K	[k	{
12	1	1	0	0	44	<	L	¥	l	l
13	1	1	0	1	45	=	M]	m	}
14	1	1	1	0	46	>	N	^	n	~
15	1	1	1	1	47	?	O	_	o	

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Figure G-11. JIS Roman Character Set.

SPANISH CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	32	0	\$	P	`	p
1	0	0	0	1	33	1	A	Q	a	q
2	0	0	1	0	34	2	B	R	b	r
3	0	0	1	1	35	3	C	S	c	s
4	0	1	0	0	36	4	D	T	d	t
5	0	1	0	1	37	5	E	U	e	u
6	0	1	1	0	38	6	F	V	f	v
7	0	1	1	1	39	7	G	W	g	w
8	1	0	0	0	40	8	H	X	h	x
9	1	0	0	1	41	9	I	Y	i	y
10	1	0	1	0	42	:	J	Z	j	z
11	1	0	1	1	43	;	K	i	k	°
12	1	1	0	0	44	<	L	Ñ	l	ñ
13	1	1	0	1	45	=	M	¿	m	ç
14	1	1	1	0	46	>	N	^	n	~
15	1	1	1	1	47	?	O	_	o	

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Figure G-12. Spanish Character Set.

SWEDISH CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0		0	@	P	`	p
1	0	0	0	1	!	1	A	Q	a	q
2	0	0	1	0	"	2	B	R	b	r
3	0	0	1	1	#	3	C	S	c	s
4	0	1	0	0	œ	4	D	T	d	t
5	0	1	0	1	%	5	E	U	e	u
6	0	1	1	0	&	6	F	V	f	v
7	0	1	1	1	'	7	G	W	g	w
8	1	0	0	0	(	8	H	X	h	x
9	1	0	0	1	)	9	I	Y	i	y
10	1	0	1	0	*	:	J	Z	j	z
11	1	0	1	1	+	;	K	Ä	k	ä
12	1	1	0	0	,	<	L	Ö	l	ö
13	1	1	0	1	-	=	M	Å	m	å
14	1	1	1	0	·	>	N	^	n	-
15	1	1	1	1	/	?	O	_	o	

7139-4A

Figure G-13. Swedish Character Set.

SWEDISH NAMES CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0		0	É	P	é	p
1	0	0	0	1	!	1	A	Q	a	q
2	0	0	1	0	"	2	B	R	b	r
3	0	0	1	1	#	3	C	S	c	s
4	0	1	0	0	œ	4	D	T	d	t
5	0	1	0	1	%	5	E	U	e	u
6	0	1	1	0	&	6	F	V	f	v
7	0	1	1	1	'	7	G	W	g	w
8	1	0	0	0	(	8	H	X	h	x
9	1	0	0	1)	9	I	Y	i	y
10	1	0	1	0	*	:	J	Z	j	z
11	1	0	1	1	+	;	K	Ä	k	ä
12	1	1	0	0	,	<	L	Ö	l	ö
13	1	1	0	1	-	=	M	Å	m	å
14	1	1	1	0	·	>	N	Ü	n	ü
15	1	1	1	1	/	?	O	_	o	

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Figure G-14. Swedish Names Character Set.

SWISS-GERMAN CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	32	ø 48	à 64	P 80	ô 96	p 112
1	0	0	0	1	33	! 49	A 65	Q 81	a 97	q 113
2	0	0	1	0	34	" 50	B 66	R 82	b 98	r 114
3	0	0	1	1	35	û 51	C 67	S 83	c 99	s 115
4	0	1	0	0	36	\$ 52	D 68	T 84	d 100	t 116
5	0	1	0	1	37	% 53	E 69	U 85	e 101	u 117
6	0	1	1	0	38	& 54	F 70	V 86	f 102	v 118
7	0	1	1	1	39	' 55	G 71	W 87	g 103	w 119
8	1	0	0	0	40	(56	H 72	X 88	h 104	x 120
9	1	0	0	1	41	) 57	I 73	Y 89	i 105	y 121
10	1	0	1	0	42	* 58	J 74	Z 90	j 106	z 122
11	1	0	1	1	43	+ 59	K 75	é 91	k 107	ä 123
12	1	1	0	0	44	, 60	L 76	ç 92	l 108	ö 124
13	1	1	0	1	45	- 61	M 77	ê 93	m 109	ü 125
14	1	1	1	0	46	. 62	N 78	î 94	n 110	û 126
15	1	1	1	1	47	/ 63	O 79	è 95	o 111	127

7139-19

Figure G-15. Swiss-German Character Set.

UNITED KINGDOM CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	32	ø 48	@ 64	P 80	ˆ 96	p 112
1	0	0	0	1	33	! 49	A 65	Q 81	a 97	q 113
2	0	0	1	0	34	" 50	B 66	R 82	b 98	r 114
3	0	0	1	1	35	£ 51	C 67	S 83	c 99	s 115
4	0	1	0	0	36	\$ 52	D 68	T 84	d 100	t 116
5	0	1	0	1	37	% 53	E 69	U 85	e 101	u 117
6	0	1	1	0	38	& 54	F 70	V 86	f 102	v 118
7	0	1	1	1	39	' 55	G 71	W 87	g 103	w 119
8	1	0	0	0	40	(56	H 72	X 88	h 104	x 120
9	1	0	0	1	41	) 57	I 73	Y 89	i 105	y 121
10	1	0	1	0	42	* 58	J 74	Z 90	j 106	z 122
11	1	0	1	1	43	+ 59	K 75	[91	k 107	£ 123
12	1	1	0	0	44	, 60	L 76	\ 92	l 108	l 124
13	1	1	0	1	45	- 61	M 77	] 93	m 109	} 125
14	1	1	1	0	46	. 62	N 78	^ 94	n 110	- 126
15	1	1	1	1	47	/ 63	O 79	_ 95	o 111	127

7139-24

Figure G-16. United Kingdom Character Set.

ASCII SUPPLEMENTAL CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	32	° 48	À 64	Ð 80	à 96	ð 112
1	0	0	0	1	i 33	± 49	Á 65	Ñ 81	á 97	ñ 113
2	0	0	1	0	¢ 34	² 50	Â 66	Ò 82	â 98	ò 114
3	0	0	1	1	£ 35	³ 51	Ã 67	Ó 83	ã 99	ó 115
4	0	1	0	0	¤ 36	´ 52	Ä 68	Ô 84	ä 100	ô 116
5	0	1	0	1	¥ 37	µ 53	Å 69	Õ 85	å 101	õ 117
6	0	1	1	0	¦ 38	¶ 54	Æ 70	Ö 86	æ 102	ö 118
7	0	1	1	1	§ 39	· 55	Ç 71	× 87	ç 103	÷ 119
8	1	0	0	0	¨ 40	¸ 56	È 72	Ø 88	è 104	ø 120
9	1	0	0	1	© 41	¹ 57	É 73	Ù 89	é 105	ù 121
10	1	0	1	0	ª 42	º 58	Ê 74	Ú 90	ê 106	ú 122
11	1	0	1	1	« 43	» 59	Ë 75	Û 91	ë 107	û 123
12	1	1	0	0	¬ 44	¼ 60	Ì 76	Ü 92	ì 108	ü 124
13	1	1	0	1	­ 45	½ 61	Í 77	Ý 93	í 109	ý 125
14	1	1	1	0	® 46	¾ 62	Î 78	Þ 94	î 110	þ 126
15	1	1	1	1	¯ 47	¿ 63	Ï 79	ß 95	ï 111	ÿ 127

7139-12A

Figure G-17. ASCII Supplemental Character Set.

DEC RULINGS CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	32	Ø 48	@ 64	P 80	◆ 96	— 112
1	0	0	0	1	! 33	1 49	A 65	Q 81	■ 97	— 113
2	0	0	1	0	" 34	2 50	B 66	R 82	HT 98	— 114
3	0	0	1	1	# 35	3 51	C 67	S 83	F 99	— 115
4	0	1	0	0	\$ 36	4 52	D 68	T 84	CR 100	† 116
5	0	1	0	1	% 37	5 53	E 69	U 85	LF 101	‡ 117
6	0	1	1	0	& 38	6 54	F 70	V 86	° 102	⌋ 118
7	0	1	1	1	' 39	7 55	G 71	W 87	± 103	T 119
8	1	0	0	0	(40	8 56	H 72	X 88	NL 104	| 120
9	1	0	0	1	) 41	9 57	I 73	Y 89	VT 105	≤ 121
10	1	0	1	0	* 42	: 58	J 74	Z 90	J 106	≥ 122
11	1	0	1	1	+ 43	; 59	K 75	[91	⌈ 107	π 123
12	1	1	0	0	, 44	< 60	L 76	\ 92	⌊ 108	≠ 124
13	1	1	0	1	- 45	= 61	M 77	] 93	L 109	£ 125
14	1	1	1	0	· 46	> 62	N 78	^ 94	† 110	· 126
15	1	1	1	1	/ 47	? 63	O 79	_ 95	— 111	127

7139-11A

Figure G-18. DEC Rulings Character Set.

DEC SUPPLEMENTAL CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0		° ₃₂	À ₆₄	¿ ₈₀	à ₉₆	¿ ₁₁₂
1	0	0	0	1	í ₃₃	± ₄₉	Á ₆₅	Ñ ₈₁	á ₉₇	ñ ₁₁₃
2	0	0	1	0	¢ ₃₄	² ₅₀	Â ₆₆	Ò ₈₂	â ₉₈	ò ₁₁₄
3	0	0	1	1	£ ₃₅	³ ₅₁	Ã ₆₇	Ó ₈₃	ã ₉₉	ó ₁₁₅
4	0	1	0	0	§ ₃₆	¶ ₅₂	Ä ₆₈	Ô ₈₄	ä ₁₀₀	ô ₁₁₆
5	0	1	0	1	¥ ₃₇	µ ₅₃	Å ₆₉	Õ ₈₅	å ₁₀₁	õ ₁₁₇
6	0	1	1	0	§ ₃₈	¶ ₅₄	Æ ₇₀	Ö ₈₆	æ ₁₀₂	ö ₁₁₈
7	0	1	1	1	§ ₃₉	¶ ₅₅	Ç ₇₁	Œ ₈₇	ç ₁₀₃	œ ₁₁₉
8	1	0	0	0	¸ ₄₀	¿ ₅₆	È ₇₂	Ø ₈₈	è ₁₀₄	ø ₁₂₀
9	1	0	0	1	© ₄₁	¹ ₅₇	É ₇₃	Ù ₈₉	é ₁₀₅	ù ₁₂₁
10	1	0	1	0	ª ₄₂	º ₅₈	Ê ₇₄	Û ₉₀	ê ₁₀₆	ú ₁₂₂
11	1	0	1	1	« ₄₃	» ₅₉	Ë ₇₅	Ü ₉₁	ë ₁₀₇	û ₁₂₃
12	1	1	0	0	¼ ₄₄	¼ ₆₀	Ì ₇₆	Ü ₉₂	ì ₁₀₈	ü ₁₂₄
13	1	1	0	1	½ ₄₅	½ ₆₁	Í ₇₇	Ý ₉₃	í ₁₀₉	ÿ ₁₂₅
14	1	1	1	0	¾ ₄₆	¾ ₆₂	Î ₇₈	¿ ₉₄	î ₁₁₀	¿ ₁₂₆
15	1	1	1	1	¿ ₄₇	¿ ₆₃	Ï ₇₉	ß ₉₅	ï ₁₁₁	¿ ₁₂₇

7139-13R

Figure G-19. DEC Supplemental Character Set.

DEC TECHNICAL CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	¿ ₃₂	} ₄₈	÷ ₆₄	Π ₈₀	¬ ₉₆	π ₁₁₂
1	0	0	0	1	√ ₃₃	∇ ₄₉	∞ ₆₅	Ψ ₈₁	α ₉₇	ψ ₁₁₃
2	0	0	1	0	Γ ₃₄	∠ ₅₀	∞ ₆₆	¿ ₈₂	β ₉₈	ρ ₁₁₄
3	0	0	1	1	— ₃₅	\ ₅₁	÷ ₆₇	Σ ₈₃	χ ₉₉	σ ₁₁₅
4	0	1	0	0	∫ ₃₆	/ ₅₂	Δ ₆₈	¿ ₈₄	δ ₁₀₀	τ ₁₁₆
5	0	1	0	1	∫ ₃₇	— ₅₃	∇ ₆₉	¿ ₈₅	ε ₁₀₁	¿ ₁₁₇
6	0	1	1	0	|₃₈	— ₅₄	Φ ₇₀	√ ₈₆	Ψ ₁₀₂	f ₁₁₈
7	0	1	1	1	|₃₉	> ₅₅	Γ ₇₁	Ω ₈₇	γ ₁₀₃	ω ₁₁₉
8	1	0	0	0	L ₄₀	¿ ₅₆	~ ₇₂	≡ ₈₈	η ₁₀₄	ξ ₁₂₀
9	1	0	0	1	] ₄₁	¿ ₅₇	≈ ₇₃	Υ ₈₉	ι ₁₀₅	υ ₁₂₁
10	1	0	1	0	J ₄₂	¿ ₅₈	Θ ₇₄	≡ ₉₀	Θ ₁₀₆	ζ ₁₂₂
11	1	0	1	1	{ ₄₃	¿ ₅₉	× ₇₅	≡ ₉₁	κ ₁₀₇	← ₁₂₃
12	1	1	0	0	{ ₄₄	≤ ₆₀	Λ ₇₆	∩ ₉₂	λ ₁₀₈	↑ ₁₂₄
13	1	1	0	1	} ₄₅	= ₆₁	Φ ₇₇	∪ ₉₃	¿ ₁₀₉	→ ₁₂₅
14	1	1	1	0	} ₄₆	≥ ₆₂	⇒ ₇₈	^ ₉₄	ν ₁₁₀	↓ ₁₂₆
15	1	1	1	1	{ ₄₇	∫ ₆₃	≡ ₇₉	∇ ₉₅	∂ ₁₁₁	¿ ₁₂₇

7139-18

Figure G-20. DEC Technical Character Set.

HEWLETT-PACKARD SUPPLEMENTAL CHARACTER SET

ROW	COLUMN				2		3		4		5		6		7	
	BITS				8 7 6 5		8 7 6 5		8 7 6 5		8 7 6 5		8 7 6 5		8 7 6 5	
	4	3	2	1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1	1 0 0 0	1 0 0 1	1 0 1 0	1 0 1 1	1 1 0 0	1 1 0 1
0	0	0	0	0		32	—	48	â	64	Å	80	Á	96	Þ	112
1	0	0	0	1	À	33	ÿ	49	ê	65	î	81	Ã	97	þ	113
2	0	0	1	0	Â	34	ý	50	ô	66	ø	82	ä	98	·	114
3	0	0	1	1	È	35	°	51	û	67	Æ	83	Ð	99	µ	115
4	0	1	0	0	Ê	36	Ç	52	á	68	å	84	ð	100	¶	116
5	0	1	0	1	Ë	37	ç	53	é	69	í	85	Í	101	¾	117
6	0	1	1	0	Î	38	Ñ	54	ó	70	ø	86	Ì	102	—	118
7	0	1	1	1	Ï	39	ñ	55	ú	71	æ	87	Ó	103	¼	119
8	1	0	0	0	—	40	ì	56	à	72	Ä	88	Ö	104	½	120
9	1	0	0	1	—	41	í	57	è	73	ï	89	Õ	105	¾	121
10	1	0	1	0	^	42	æ	58	ò	74	Ö	90	Ö	106	ø	122
11	1	0	1	1	—	43	£	59	ù	75	Ü	91	—	107	«	123
12	1	1	0	0	~	44	¥	60	ä	76	É	92	—	108	■	124
13	1	1	0	1	Û	45	§	61	ë	77	ï	93	Ú	109	»	125
14	1	1	1	0	Ü	46	ƒ	62	ö	78	ß	94	ÿ	110	±	126
15	1	1	1	1	ℓ	47	¢	63	ü	79	ô	95	ÿ	111	—	127

Figure G-21. Hewlett-Packard Supplemental Character Set.

TEKTRONIX SUPPLEMENTAL CHARACTER SET

ROW	COLUMN				2		3		4		5		6		7	
	BITS				8 7 6 5		8 7 6 5		8 7 6 5		8 7 6 5		8 7 6 5		8 7 6 5	
	4	3	2	1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1	1 0 0 0	1 0 0 1	1 0 1 0	1 0 1 1	1 1 0 0	1 1 0 1
0	0	0	0	0		32	°	48	—	64	Ñ	80	◆	96	—	112
1	0	0	0	1	Ä	33	¹	49	¢	65	ñ	81	■	97	—	113
2	0	0	1	0	ä	34	²	50	¡	66	¿	82	H	98	—	114
3	0	0	1	1	Å	35	³	51	†	67	í	83	F	99	—	115
4	0	1	0	0	å	36	⁴	52	□	68	α	84	Ⓒ	100	†	116
5	0	1	0	1	Æ	37	⁵	53	■	69	σ	85	Ⓕ	101	†	117
6	0	1	1	0	æ	38	⁶	54	●	70	τ	86	°	102	⊥	118
7	0	1	1	1	à	39	⁷	55	Δ	71	ψ	87	±	103	⊤	119
8	1	0	0	0	ç	40	⁸	56	ð	72	μ	88	N	104	⊥	120
9	1	0	0	1	é	41	⁹	57	λ	73	Σ	89	Ⓜ	105	≤	121
10	1	0	1	0	è	42	¹⁰	58	⌈	74	Ω	90	Ⓜ	106	≥	122
11	1	0	1	1	ö	43	¹¹	59	ℓ	75	Ⓒ	91	⌈	107	π	123
12	1	1	0	0	ö	44	¹²	60	⌈	76	Ⓜ	92	⌈	108	≠	124
13	1	1	0	1	ø	45	¹³	61	⌈	77	÷	93	Ⓜ	109	£	125
14	1	1	1	0	Ü	46	¹⁴	62	⌈	78	≈	94	Ⓜ	110	·	126
15	1	1	1	1	ü	47	¹⁵	63	∞	79	√	95	—	111	—	127

Figure G-22. Tektronix Supplemental Character Set.

TEKTRONIX 4696 SUPPLEMENTAL CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	¥ 32	Á 48		ò 80	¿ 96	¿ 112
1	0	0	0	1	© 33	Â 49	Û 65	ó 81	¿ 97	¿ 113
2	0	0	1	0	ä 34	Ã 50	Ü 66	ô 82	¿ 98	¿ 114
3	0	0	1	1	« 35	Ç 51	Û 67	õ 83	¿ 99	¿ 115
4	0	1	0	0	¿ 36	È 52	Ý 68	ú 84	¿ 100	¿ 116
5	0	1	0	1	© 37	É 53	Þ 69	û 85	¿ 101	¿ 117
6	0	1	1	0	Ï 38	Ê 54	á 70	ý 86	¿ 102	¿ 118
7	0	1	1	1	´ 39	Ë 55	â 71	þ 87	¿ 103	¿ 119
8	1	0	0	0	¶ 40	Ì 56	ã 72	ÿ 88	¿ 104	¿ 120
9	1	0	0	1	· 41	Í 57	ê 73	× 89	¿ 105	¿ 121
10	1	0	1	0	ø 42	Î 58	ë 74	¿ 90	¿ 106	¿ 122
11	1	0	1	1	» 43	Ï 59	ì 75	¿ 91	¿ 107	¿ 123
12	1	1	0	0	¼ 44	Ð 60	í 76	¿ 92	¿ 108	¿ 124
13	1	1	0	1	½ 45	Ò 61	î 77	¿ 93	¿ 109	¿ 125
14	1	1	1	0	¾ 46	Ó 62	ï 78	¿ 94	¿ 110	¿ 126
15	1	1	1	1	À 47	Ô 63	ð 79	¿ 95	¿ 111	¿ 127

7139-14A

Figure G-23. Tektronix 4696 Supplemental Character Set.

TEKTRONIX COLORQUICK SUPPLEMENTAL CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5 0 0 1 0	8 7 6 5 0 0 1 1	8 7 6 5 0 1 0 0	8 7 6 5 0 1 0 1	8 7 6 5 0 1 1 0	8 7 6 5 0 1 1 1
0	0	0	0	0	¥ 32	Á 48		ò 80	¿ 96	¿ 112
1	0	0	0	1	© 33	Â 49	Û 65	ó 81	¿ 97	¿ 113
2	0	0	1	0	ä 34	Ã 50	Ü 66	ô 82	¿ 98	¿ 114
3	0	0	1	1	« 35	Ç 51	Û 67	õ 83	¿ 99	¿ 115
4	0	1	0	0	ÿ 36	È 52	Ý 68	ú 84	¿ 100	¿ 116
5	0	1	0	1	© 37	É 53	Þ 69	û 85	¿ 101	¿ 117
6	0	1	1	0	Ï 38	Ê 54	á 70	ý 86	¿ 102	¿ 118
7	0	1	1	1	´ 39	Ë 55	â 71	þ 87	¿ 103	¿ 119
8	1	0	0	0	¶ 40	Ì 56	ã 72	ÿ 88	¿ 104	¿ 120
9	1	0	0	1	· 41	Í 57	ê 73	× 89	¿ 105	¿ 121
10	1	0	1	0	ø 42	Î 58	ë 74	æ 90	¿ 106	¿ 122
11	1	0	1	1	» 43	Ï 59	ì 75	œ 91	¿ 107	¿ 123
12	1	1	0	0	¼ 44	Ð 60	í 76	ø 92	¿ 108	¿ 124
13	1	1	0	1	½ 45	Ò 61	î 77	ŕ 93	¿ 109	¿ 125
14	1	1	1	0	¾ 46	Ó 62	ï 78	ƒ 94	¿ 110	¿ 126
15	1	1	1	1	À 47	Ô 63	ð 79	ℓ 95	¿ 111	¿ 127

7139-17

Figure G-24. Tektronix ColorQuick Supplemental Character Set.

NORTH AMERICAN EBCDIC CHARACTER SET (COAX OPTION)

BINARY BITS	0,1		00				01				10				11			
	2,3		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11
	4,5,6,7	HEX 1 0	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0000	0	NUL					SP	&	—						{	}	\	0
0001	1		SBA						/		a	j	—		A	J		1
0010	2		EUA								b	k	s		B	K	S	2
0011	3		IC								c	l	t		C	L	T	3
0100	4										d	m	u		D	M	U	4
0101	5	PT	NL								e	n	v		E	N	V	5
0110	6										f	o	w		F	O	W	6
0111	7										g	p	x		G	P	X	7
1000	8	GE		SA							h	q	y		H	Q	Y	8
1001	9		EM	SFE					`		i	r	z		I	R	Z	9
1010	A						\$	!	|	:							
1011	B						.	£	,	#								
1100	C	FF	DUP	MF	RA		<	*	%	@								
1101	D	CR	SF				()	—	'								
1110	E		FM				+	;	>	=								
1111	F				SUB		|	⌋	?	"								

4890-69A

Figure G-25. North American EBCDIC Character Set (Coax).

NOTE

You can find EBCDIC code charts for language-dependent character sets in Section 10 of the Programmers Manual.

NORTH AMERICAN ASCII CHARACTER SET

ROW	COLUMN				2	3	4	5	6	7
	4	3	2	1	8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5	8 7 6 5
0	0	0	0	0	0010	0011	0100	0101	0110	0111
1	0	0	0	1	!	1	A	Q	a	q
2	0	0	1	0	"	2	B	R	b	r
3	0	0	1	1	#	3	C	S	c	s
4	0	1	0	0	\$	4	D	T	d	t
5	0	1	0	1	%	5	E	U	e	u
6	0	1	1	0	&	6	F	V	f	v
7	0	1	1	1	'	7	G	W	g	w
8	1	0	0	0	(	8	H	X	h	x
9	1	0	0	1	)	9	I	Y	i	y
10	1	0	1	0	*	:	J	Z	j	z
11	1	0	1	1	+	;	K	[	k	{
12	1	1	0	0	,	<	L	\	l	|
13	1	1	0	1	-	=	M	]	m	}
14	1	1	1	0	.	>	N	^	n	~
15	1	1	1	1	/	?	O	_	o	

Figure G-26. North American ASCII Character Set.

EIGHT-BIT ASCII CODE CHART

CONTROL CHARACTERS				CONTROL CHARACTERS				DISPLAYABLE CHARACTERS				DISPLAYABLE CHARACTERS					
(HEX VALUE OF 4 UPPER BITS)																	
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
(HEX VALUE OF 4 LOWER BITS)	0	NU ₀ DL ₁₆								DCS							
	1	SH ₁ D ₁ ₁₇								PU1							
	2	SX ₂ D ₂ ₁₈								PU2							
	3	EX ₃ D ₃ ₁₉								STS							
	4	ET ₄ D ₄ ₂₀								IND CCH ₁₃₂ 148							
	5	EQ ₅ NK ₂₁								NEL MW ₁₃₉ 149							
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Figure G-27. 8-Bit ASCII Code Chart (with control characters).

GLOSSARY

ADE

ASCII decimal equivalent, two decimal digits that represent* an ASCII alphanumeric character or *control character*. For example, the character *A* has ADE value 65.

alphatext

One of two styles of text. Alphatext is made up of dot matrix characters and is used primarily in the dialog area, as opposed to *graphtext*, which is used in the graphics area. See also *character set*.

ANSI

The American National Standards Institute. This is the USA member body of the International Organization for Standardization (ISO).

ANSI mode

One of the *host command modes*. ANSI mode allows the 4211 to interpret *ANSI Standard X3.64* screen-editing commands and commands that control the dialog display and keyboard characteristics.

answerback

A password-like string of characters that the 4211 transmits to the host upon request. This security feature allows the host to control the 4211 access to programs and data.

arrow keys

A group of keys on the keyboard used to move the GIN cursor in the graphics area or to scroll text in the dialog area.

ASCII

The American Standard Code for Information Interchange. ASCII is a scheme of data representation, established by *ANSI*, in which characters and control codes are represented by seven-bit patterns.

ASCII keys

The standard alphanumeric keys of the keyboard, similar to the letter and number keys on a typewriter. These keys transmit the ASCII codes corresponding to the symbols on the key caps.

aspect ratio

The ratio between the length and width of the *framing box* used in *Zoom/Pan operations*.

autoprint

See *data logging*.

baud rate

A measure of the speed of data communication; in RS-232-C communications, a speed of 300 baud corresponds to 300 bits per second.

border

A line outlining part of the display: (1) Zoom/Pan display boundary, controlled by the BORDER viewing key; (2) *viewport* boundary, controlled by the BORDER command; or (3) *panel* boundary, controlled by the BEGINPANEL command.

Break key

A key that transmits an interrupt signal to the computer.

Cancel key

A key that you can press to cancel various 4211 operations, such as copy operations.

Caps Lock key

A key that causes letters typed at the keyboard to be transmitted in uppercase (unlike the Shift Lock key on a typewriter, the Caps Lock does *not* affect numeric or special symbol keys).

character cell

The rectangular area surrounding an *alphatext* character displayed in the *dialog area*.

character set

A predefined set of alphanumeric symbols that are used to display *alphatext* (the alphatext character sets are also used as a default to display *graphtext*). Nine *alphanumeric character sets* exist — one for each available keyboard — as well as six *special character sets*. See also *alphatext*, *graphtext*, and *font*.

cluster name

A name that identifies a functional group of commands; you can specify the cluster name when issuing the HELP or STATUS commands to display information about a group of commands.

* Italicized words within a definition are terms also defined in this glossary.

CMY color coordinate system

A method of representing a color mixture by specifying the percentages of cyan, magenta, and yellow in each color.

color coordinate systems

Three methods exist for representing a color mixture: *CMY color coordinate system*, *HLS color coordinate system*, and *RGB color coordinate system*.

color copier

A *hardcopy device* that prints pixel-by-pixel color copies of graphics and text displayed. Supported color copiers include the TEKTRONIX 4692 and 4696 Color Graphics Copiers and the 4693D Color Image Printer.

color index

See *index*.

color map

A table in memory that stores each *color mixture* definition. The 4211 uses the color map to translate an *index* number into a color on the display.

color mixture

A color uniquely identified by an *index* and defined by the combination of *hue*, *lightness*, and *saturation* (as in the *HLS color coordinate system*) or three *primary colors* (as in the *CMY color coordinate system* and the *RGB color coordinate system*).

Compose key

Allows composition of characters not shown on keyboard.

Control Unit Terminal mode

One of the two attachment modes for communication between an IBM *control unit* and a 4211 with the *coax* option; CUT mode permits only one 4211 session at a time. Compare to *Distributed Function Terminal mode*.

copier

See *color copier*, *monochrome graphics printer*, *monochrome text printer*.

COPIER port

The Centronics-style port and associated firmware that lets you connect Tektronix color copiers and monochrome printers and other *hardcopy devices* to the 4211.

crosshair cursor

The default cursor displayed during GIN operations — a pair of movable crosshairs that the user can control with the GIN device.

Ctrl key

A key that can be held down while pressing another key to alter the second key's function.

cursor

A symbol on a display screen, used to indicate where characters or other input entered from the keyboard will be placed. The 4211 has an *alpha cursor* for dialog area text and a *crosshair cursor* for GIN.

cursor pad

On older Tektronix keyboards, a square pad on used to move the GIN cursor in the graphics area or to scroll text in the dialog area. Replaced by *arrow keys* on newer Tektronix keyboards.

CUT mode

See *Control Unit Terminal Mode*.

data logging

The process of writing data simultaneously to the dialog area and a copier or printer.

Data Processing keys

On certain international keyboards, alphanumeric keys that send either characters from the national character set or characters from the ASCII character set, depending on the setting of the KEYUSEMODE command.

DEGAUSS button

A button on the Display module that you can press to restore color accuracy by demagnetizing the display screen.

DEras key

A key that you can press to erase the *dialog area*.

DFT mode

See *Distributed Function Terminal mode*.

dialog area

The part of the screen that displays communications (prompts, user entries, error messages) between a host program and users, and text when using text editing programs. The dialog area is superimposed over the *graphics area*.

dialog buffer

An area of 4211 memory used to store information for display in the *dialog area*.

dialog copy

A *hardcopy* of text stored in the *dialog buffer*.

Dialog key

A key that you can press to make the *dialog area* visible (or invisible).

Display module

A device that receives video output from the Graphics module and displays it on a screen. See *Graphics module*.

Distributed Function Terminal mode

One of the two attachment modes for communication between an IBM *control unit* and a 4211 with the *coax* option; DFT mode permits up to five 4211 sessions at a time. Compare to *Control Unit Terminal Mode*.

editing characters

Special characters (used in Setup only) which allow you to delete characters, delete lines, or cause an editing character to be printed literally.

EOF string

A character or sequence of characters that are used to identify the end of a file; the EOF string is used to terminate copy operations.

EOL string

A character or sequence of characters that are used to identify the end of a line of text sent to the host or to a *hardcopy device*. The 4211 default EOL string is the Carriage Return (^CR character).

EOM character

One of two characters that the 4211 can use to control the flow of data to the host. The default EOM character is ^NU.

Extended Self-Test

A diagnostic self-test that you should perform if results of Power-Up Self-Test suggest more that testing is required.

factory default

The value assigned to a command setting as delivered from the factory. You can reset all settings to the factory default values by issuing the FACTORY command.

fill pattern

One of the predefined patterns and solid colors used for filling *panels*.

font

A set of alphanumeric or graphics symbols used to display *graphtext*. You can create your own *graphtext* fonts. When using predefined *graphtext* fonts, the 4211 uses the default *character sets*.

frames

Temporary images of parts of the graphics image that are created and stored during *Zoom* and *Pan* operations.

framing box

A rectangular boundary displayed during *Zoom* and *Pan* operations to identify the part of the graphics display to be displayed in greater detail. The *Zoom* function enlarges or reduces the size of the framing box, and the *Pan* function moves the framing box about on the screen.

function keys

The keys that invoke specialized functions with a single keystroke. The function invoked by a specific function key is determined by the software, application program, or keyboard functionality in use.

GEras key

A key that you can press to erase the *graphics area*.

GIN (graphics Input)

The unique method of processing graphics input. When GIN is enabled, users *input* a point and the 4211 converts the location of that point into a digital form that can be transmitted to and interpreted by a host computer.

GIN cursor

A symbol that the user can move about on the display screen during GIN to select a point to *input*. The default GIN cursor is the *crosshair cursor*; you can replace the crosshair cursor with a segment.

GIN device

The device used during GIN operations to control the GIN cursor and to transmit positional data to the 4211. The GIN devices are the cursor pad and the graphics tablet.

GIN Inking

A GIN option in which the lines that join the points that the user inputs are displayed (inked).

GIN rubberbanding

A GIN option in which an elastic line drawn from the *graphics position* to the GIN cursor position is displayed.

graphics area

The part of the screen that displays graphics images. When visible, the dialog area may obscure part of it. Compare to *dialog area*.

graphics Input

See *GIN*.

Graphics module

A device that gets data from a host, keyboard, or peripheral and processes it for display on the Display module. See *Display module*.

graphics primitives

The fundamental elements of a graphics display: *alphatext* displayed in the graphics area, *graphtext*, *markers*, *panels*, *Pick IDs*, *vectors*, and *segment calls*. *Segments* are made up of graphics primitives.

graphics tablet

A graphics input device consisting of a tablet and a movable puck or stylus. A graphics tablet is used to indicate locations and to transmit positional information to the 4211 during *GIN*.

graphtext

Text designed for use in the graphics area. Commands allow scaling and rotating text with the ability to define your own font styles.

handshaking

A formalized sequence of operations for pacing the flow of data between the 4211 and a host or peripheral.

HLS Color Coordinate System

A method of representing a color mixture by specifying *hue*, *lightness*, and *saturation*.

hardcopy

A physical copy (typically printed on paper) of alphanumeric or graphics data.

hardcopy device

One the supported Centronics-style copy devices. See *color copiers*, *monochrome graphics printers*, *monochrome text printers*.

host

A computer device that controls the exchange of data between itself and another computer device.

host port

A connector and the associated firmware that permit communication with a host computer.

HOSTPORT COAX

The coaxial host port (labeled *COMM*) that can be connected to an IBM host computer.

HOSTPORT HO:

The RS-232-C host port (labeled *COMPUTER*) that can be connected to a variety of host computers.

host syntax

The conventions that a program running on a host computer must use to send commands to the 4211. Compare to *Setup syntax*.

hue

The first coordinate of the *HLS color coordinate system*. Hue specifies color as an angle between 0° and 360°; for example, 120° selects red.

Index

A number that specifies a location in the *color map*, which stores *color mixtures*. You can change the color mixture assigned to an index using Setup commands.

Input

In *GIN* operations, the process of selecting a location (by moving the *GIN cursor*) and transmitting it to the host (by pressing a key).

Input queue

The part of the 4211's general-purpose memory used to store data received from other devices. See also *output queue*.

key combination

The combination of the Ctrl key and/or the Shift key with another keyboard key (holding down the Ctrl key, the Shift key, or the Ctrl-Shift combination while pressing another keyboard key causes the key to transmit different values than it would when pressed alone).

key-execute character

A special character used in *macro* definitions to control whether the macro contents are processed locally or transmitted to the host computer.

key macro

A *macro* that can be invoked from the keyboard by pressing a single key or a key combination.

keyboard

An input device connected to the Graphics module that contains ASCII keys, programmable function keys, a numeric keypad, and arrow keys for scrolling text and controlling the graphics cursor.

keyword

In *Setup syntax* a parameter that consists of a single word that specifies a choice or action.

LAN

See *local area network*.

landscape format

A copy option for some copiers in which the copier prints the long axis of the graphics image aligned with the long axis of the paper (or other copy media). See *portrait format*.

lightness

The second coordinate in the *HLS color coordinate system*. Lightness is the proportion of white in a *color mixture*, specified as a percentage between 0% (pure black) and 100% (pure white).

local area network

The linking together of 4211's, workstations, and computers via cables and microwave links so the users can access more than one computer or workstation on the LAN.

loopback connector

An optional accessory connector used during the *Extended Self Test*.

macro

A sequence of commands or data that has been predefined so that it can be invoked by a single command or keystroke.

marker

A predefined symbol used to identify important points in a drawing, such as data points on a graph or cities on a map.

memory

A part of a computer or other data processing device that stores data. See *nonvolatile memory*, *random access memory*, *read-only memory*.

Menu key

The key that can be pressed to display the Zoom/Pan menu and Coax Configuration menu.

monochrome graphics printer

A hard-copy device that prints pixel-by-pixel monochrome copies of graphics and text. The supported monochrome copiers are the TEKTRONIX 4644 Dot-Matrix Printer, Hewlett-Packard ThinkJet, Hewlett-Packard LaserJet+, and Epson FX-80 Printers.

monochrome text printer

A hard-copy device that prints monochrome alphanumeric characters. A variety of monochrome printers will work, but will support only *dialog copies*.

nonvolatile commands

Commands whose settings can be saved in the 4211's *nonvolatile memory*.

nonvolatile memory

An internal memory that stores data while the 4211 is turned off.

numeric keypad

A group of keys on the keyboard that are laid out like a standard ten-key adding machine. The numeric keypad can be used for numeric data entry or for application-defined programmed functions.

omitted default

The value automatically assigned to a command *parameter* when you issue the command without including the parameter.

host command modes

The three modes that determine which *command set* a host program must use to issue commands to the 4211. The host command modes are *ANSI mode*, *Tek mode*, and *VT52 mode*.

output queue

A part of 4211 memory that is used to store data to be transmitted to other devices. See also *input queue*.

Pan

A feature that allows you to select a part of the screen for detailed viewing. See also *viewing keys*, *Zoom*, and *Zoom/Pan menu*.

parameter

Variable information that must be included in many computer commands or instructions to represent data or a choice between options.

parity

A data-transmission scheme in which an extra bit is transmitted with each byte of data to indicate whether the sum of the bits in the byte is odd or even. The parity bit is set by the transmitting device and enables the receiving device to verify the transmitted data.

peripheral device

A device used to input data or process output data for the 4211. The supported peripheral devices include *color copiers*, *graphics tablets*, *monochrome graphics printers*, *monochrome text printers*, *plotters*, and a *rasterizer*.

pixel

The smallest unit of the screen display that can be assigned attributes.

plotter

An output device with one or more movable pens. A plotter can create graphics images from plotter commands stored in the 4211 memory or host computer memory. Supported Tektronix plotters are the TEKTRONIX 4662 and 4663 Interactive Digital Plotters.

port

A physical connection (such as a multipin connector or coaxial connector) along with the associated firmware that permits one computing device to communicate data and control information with another computing device or peripheral device.

PORT 0

One of the two RS-232 peripheral ports that make up the *two-port peripheral interface (2PPI)*.

PORT 1

One of the two RS-232 peripheral ports that make up the *two-port peripheral interface (2PPI)*.

portrait format

A copy option for some graphics copiers in which the copier prints the long axis of the graphics image aligned with the short axis of the paper (or other copy media). See *landscape format*.

Power-Up Self Test

A diagnostic self test that executes automatically each time you power up or press the Reset button on your 4211.

primary colors

One of two groups of colors that can be mixed to produce all other colors. Red, green, and blue are the RGB primary colors used in the *additive color system*. Cyan, magenta, and yellow are the CMY primary colors used in the *subtractive color system*.

printer

See *color copier, monochrome graphics printer, monochrome text printer*.

puck

A movable input device with a crosshairs and that the user can use with the TEKTRONIX 4957 and 4958 Graphic Tablets to *input* GIN data. The user moves the puck on the tablet surface so that the puck's crosshairs indicate a position and then presses one of the buttons to input the location.

random access memory (RAM)

Memory that a program can use for temporary storage of command settings and graphics data. An application program can write data to random access memory as well as read data from it. Compare to *read-only memory*.

rasterizer

A device that can interpret graphics commands and build a graphics image in its own memory for printing or plotting on another device. You can use the TEKTRONIX 4510A Rasterizer with the 4211 to produce high resolution copies.

read-only memory (ROM)

Memory that the 4211 uses for permanent storage of operating firmware. An application program can read data from read-only memory but can not alter the data there. Compare to *random access memory*.

RGB color coordinate system

A method of representing a color mixture by specifying the percentages of red, blue, and green, respectively.

RS-232-C

A standard communications interface defined by the Electronic Industries Association (EIA) to control data communications using standard voltages, signal lines, and device interactions.

rubberbanding

A GIN option in which the screen gives the user visual feedback by displaying an elastic line drawn from the last cursor position (the starting point) to the current cursor position.

rulings character set

A *character set* comprised of alphanumeric symbols and special *rulings characters*.

rulings characters

Special characters (including horizontal and vertical lines, corners, and intersections) used to generate printed forms and rulings.

saturation

The third coordinate in the *HLS color coordinate system*. Saturation is the intensity of hue in a color mixture and ranges from 0% (neutral — white, gray, or black) to 100% (pure color).

SCopy key

A key that you can press to copy the entire screen display (*dialog area* and *graphics area*) to a hardcopy device attached to the COPIER port. (Pressing the *Shift key* and SCopy key simultaneously copies just the dialog area — see *DCopy key*.)

screen copy

A hardcopy of the images displayed on the screen — a screen copy may include both graphics and dialog, depending on what's displayed on the screen.

scrolling

Vertical or horizontal movement of text on the display screen. Scrolling permits easy reading of blocks of text larger than the screen can accommodate.

segment

A collection of *graphics primitives* (alphatext in the graphics area, graphtext, lines, panels, markers, Pick IDs, segment calls) and *graphics primitives* defined as a unit so that they can be treated as a single object.

segment call

An occurrence of a segment invoked by the SGCALL command. The called segment is displayed at a specified location and may be included as a *graphics primitive* in another segment.

Self Test

See *Extended Self Test*, *Power-Up Self Test*.

SEras key

A key that you can press to erase the entire display screen (*dialog area* and *graphics area*).

Setup

A method of entering commands locally from the keyboard using the *Setup syntax*.

Setup key

A key that you can press to enter (or exit) *Setup*.

Setup prompt

An asterisk (*) displayed on the screen to indicate that the 4211 is in *Setup* and will accept commands in *Setup syntax* from the keyboard.

Setup syntax

The form of a command that is entered at the 4211 keyboard. Compare to *host syntax*.

Shift key

A key that you hold down while pressing another key to alter the second key's function. With the letter keys and number keys Shift acts like the Shift key on a typewriter.

Snoopy mode

A mode in which *host commands* and *control characters* are displayed rather than executed as they are transmitted to the 4211.

stylus

An optional pen-like device that the user can use to *input* GIN data to the TEKTRONIX 4958 Graphic Tablet.

supplemental character set

A *character set* comprised of special symbols, including ruling characters. The graphics system has six supplemental character sets: ASCII Supplemental, DEC Supplemental, Hewlett-Packard Supplemental, Tek Supplemental, Rulings, and 4696 Supplemental.

surface

An imaginary surface the size and shape of your display screen, on which you can create graphics images. Also called *graphics surface*.

Tek key

The Tek key light is on in Tek keyboard functionality, off in VT200 keyboard functionality.

Tek mode

One of the *host command modes*. Tek mode lets the 4211 interpret Tek-style commands.

text printer

See *monochrome text printer*.

two-port peripheral interface (2PPI)

Two RS-232-C connectors and the associated firmware that permit communication with Tektronix graphics tablets, rasterizers, and plotters and with some other RS-232 compatible devices. The two peripheral ports, PORT 0 and PORT 1, can be configured individually.

VIDEO connectors

The coaxial connectors that provide red, green, and blue color signals to an external monitor or to a color *hardcopy device*.

view

An image of specified graphics objects in a specific area on the display screen, called the *viewport*. You can create and store several views, then display the one you want to see.

viewing keys

The keyboard's F1, F2, F3, F4, and F5 function keys as used with the *Zoom/Pan menu*.

viewport

A rectangular area of the screen used to display a specific *view*.

VT52 mode

One of the *host command modes*. VT52 mode lets the 4211 interpret VT52-style screen editing commands and keyboard functions.

Glossary

VT100 mode

A version of *ANSI mode* that initializes the 4211 to interpret VT100-style screen editing commands and keyboard functions.

VT200 mode

A version of *ANSI mode* that initializes the 4211 to interpret VT200-style screen editing commands and keyboard functions.

window

A rectangular area of *modeling space*. The image in a window is displayed in the *viewport*. A window is defined as one characteristic of a *view*.

Zoom

A feature that allows you to enlarge part of a graphics image. See also *Pan*, *viewing keys*, and *Zoom/Pan menu*.

Zoom/Pan menu

A special display that shows a framing rectangle superimposed on the graphics image and shows *viewing key* assignments that tell you which keys to press to select and enlarge parts of an image. See *Pan*, *viewing keys*, and *Zoom*.

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